233

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Arvin	8211TB, TM (Ch. TE319-3), 8213TM (Ch. TE319-2), 8213TMA, 8215CBA (Ch. TE319-21), 8215CM (Ch. TE319-2), 8215CMA (Ch. TE319-21), 8218CB, CM (Ch. TE319-3) Tel. Rec. Prod. Chg. Bul. 89	233-1
General Electric	424, 425	233-2
Karadio	M80B	233-3
Majestic	Series 112, 112-2, 113 Tel. Rec.	233-4
Monitoradio	MR-32	233-5
Motorola	Y24K1, B, Y24K2, B, Y24K3, W, Y27K2, B, Y27K3 (Ch. TS602Y), 24K1, B, 24K2, B, 24K3, W, 27K2, B, 27K3 (Ch. TS602) Tel. Rec.	233-6
National	NC-88	233-7
Packard-Bell	2041, 2042, 2043, 2044, 2141, 2142, 2143, 2144 (Ch. 2040) Tel. Rec.	233-8
Raytheon	C-2112A, C-2113A, C-2114A, C-2115A, C-2116A, C-2118A, RC-2117A, RC-2121A, RC-2122A, RC-2123A (Ch. 21T3) Tel. Rec. Prod. Chg. Bul. 89	233-1
Roland	5P4	233-9
Scott	2510	233-10
Sheraton	17MT20, 21BC10, 21BD10, 21BT10, 21MC10, 21MD10, 21T10U (Ch. 530DX-A) Tel. Rec. Prod. Chg. Bul. 89	233-1
Truetone	2D1331A, B, 2D2334A Tel. Rec.	233-11
Westinghouse	H-409P4, H-410P4, H-411P4 (Ch. V-2185-1) & Optional Power Supply H-377	233-12
Westinghouse	H-736T17, H-738T17 (Ch. V-2227-1) Tel. Rec. Prod. Chg. Bul. 89	233-1
Zenith	L1083E, L1086R (Ch. 10L20)	233-13

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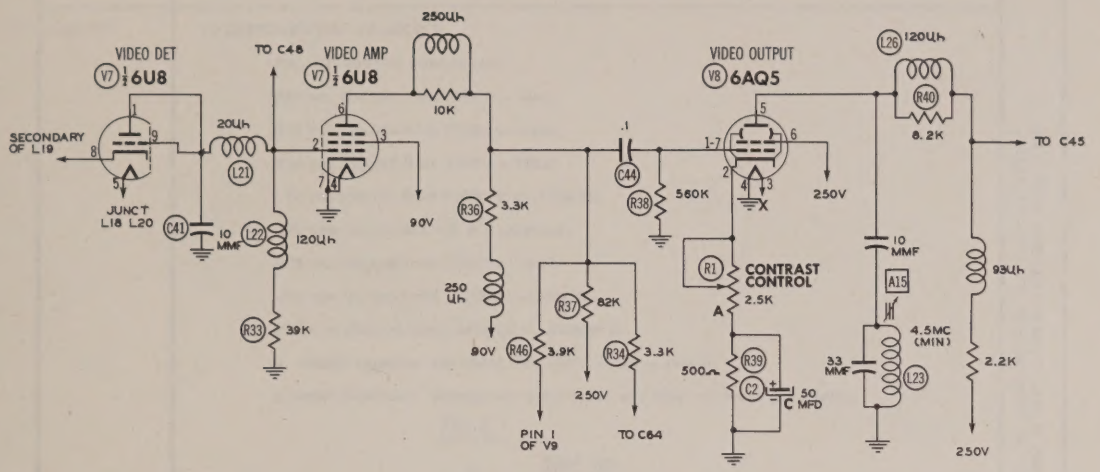
SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 9 IN SET 210

Ch. 530DX-A	Sheraton Ch. 530DX-A Series is identical to the 530DX Series, covered in Photofact Folder 9 — Set 210, except a type 6U8 tube is used for video detector and video amplifier and the video output circuit is revised. A partial schematic, showing the revised circuit is given below.



SHERATON MODELS 17MT20, 21BC10, 21BD10, 21BT10, 21MC10, 21MD10, 21T10U (Ch. 530DX-A Series)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 195

Production changes made in Arvin Ch. TE319-1 and TE319-2 are covered in Production Change Bulletin 67, Set 204-1.

Refer to this folder for changes made in earlier production.

In later production several new models have been added. A chart is given below which shows the new models with the chassis used in each.

MODEL	CHASSIS	MODEL	CHASSIS
8211TB	TE319-3	8215CM	TE319-2
8211TM	TE319-3	8215CMA	TE319-21
8213TM	TE319-2	8218CB	TE319-3
8213TMA	TE319-21	8218CM	TE319-3
8215CBA	TE319-21		

A list of the changes made in Ch. TE319-3 and TE319-21 is given below.

Ch. TE319-3	Chassis TE319-3 is identical to Chassis TE319-2 (Set 204-1) except, the picture tube was changed from a 21AP4 to a 21ZP4 tube and mechanical change was made in the control mountings.
Ch. TE319-21	Chassis TE319-21 is identical to Chassis TE319-2 except, the picture tube was changed from a 21AP4 to a 21ZP4A tube.

ARVIN MODELS 8211TB, TM (Ch. TE 319-3), 8213TM (Ch. TE 319-2), 8213TMA, 8215CBA(Ch. TE 319-21), 8215CM (Ch. TE 319-2),8215CMA(Ch. TE 319-21), 8218CB, CM(Ch. TE 319-3)

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 202

Raytheon models C-2112A, C-2113A, C-2114A, C-2115A, C-2116A, C-2118A and RC-2117A (Ch. 21T3) were covered in Photofact Folder 7, Set 202.

Models RC-2121A, RC-2122A, and RC-2123A have now been added to this group.

In later production the following changes were made.

Code 642

TO ELIMINATE SYNC BUZZ

R65 and R66 were changed from 470KΩ to 47KΩ.

A 5000MMF capacitor was added from pin 6 of V12 (AGC keying tube) to ground.

Code 742

TO IMPROVE SYNC STABILITY

R81, C77 and C79 were deleted.

R80 was changed from 330KΩ to 1Meg.

R82 was changed from 390KΩ to 22KΩ.

R84 was changed from 470KΩ to 22KΩ.

C78 was changed from 470MMF to .047MFD.

C80 was changed to a 400 volt capacitor.

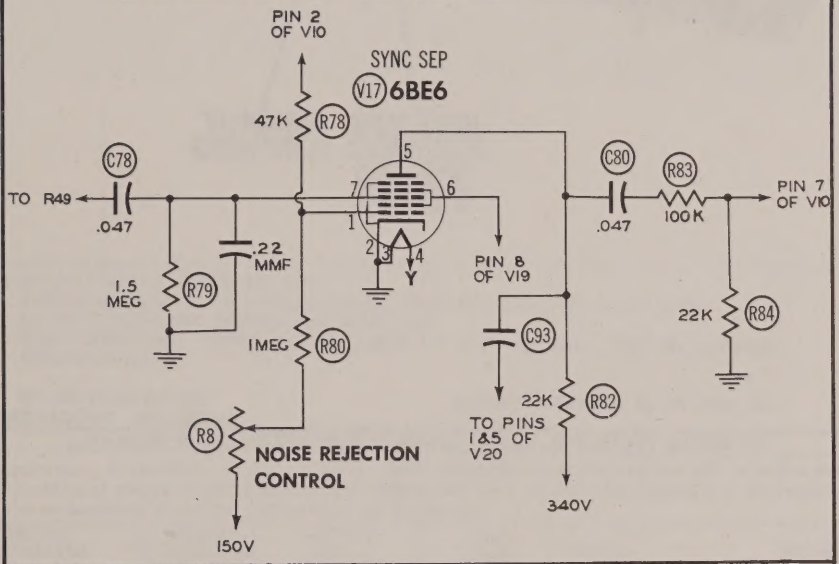
R113 was changed from 33KΩ to 6.8KΩ.

C99 was changed from .047MFD to.22MFD.

C100 was changed from .047MFD to .0022MFD.

A .22MFD capacitor was added from pin 7 of V17 to ground.

A partial schematic showing the revised sync separator circuit is given below.



Code 513

TO ELIMINATE SYNC BUZZ IN STRONG SIGNAL AREAS

Full AGC voltage was connected to the tuner RF stage.

RAYTHEON MODELS C-2112A, C-2113A, C-2114A, C-2115A, C-2116A, C-2118A, RC-2117A, RC-2121A, RC-2122A, RC-2123A (Ch. 21T3)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 214

Ch. V-2227-1

In later production of Westinghouse Models H-736T17 and H-738T17 (Ch. V-2227-1) the following changes were made.

TO INCREASE THE LOCK-IN RANGE OF THE HORIZONTAL OSCILLATOR

The horizontal multivibrator trimmer capacitor (B2) was changed from a 5-40MMF to a 5-80MMF capacitor (part #V-11228-2).

The horizontal hold control (R3) was changed from 125KΩ to 60KΩ (part #V-10915-3).

TO IMPROVE TONE COMPENSATION

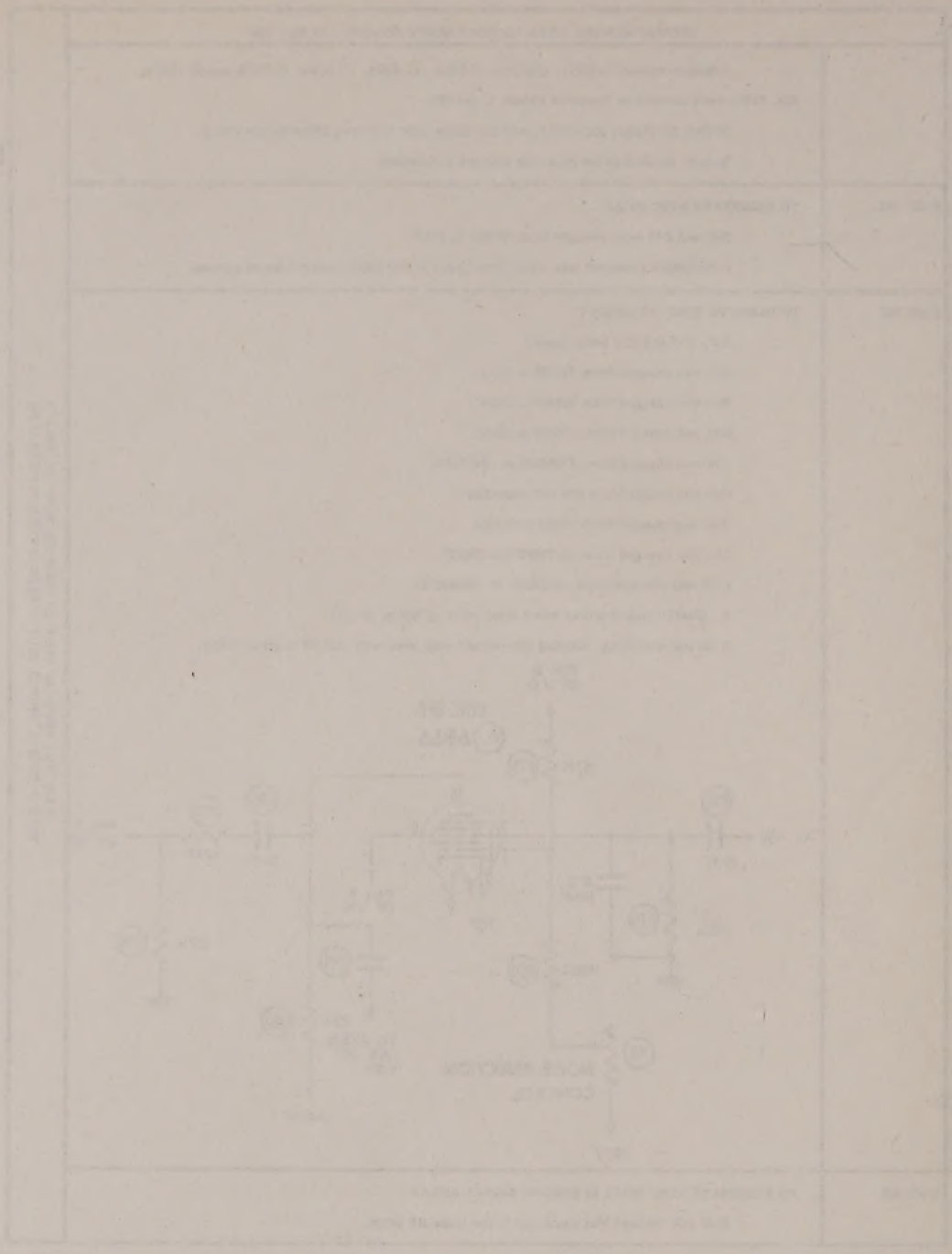
C60 was changed from .01MFD to .02MFD.

R55 was changed from 10KΩ to 27KΩ.

TO PREVENT PICTURE AND SOUND SEPARATION IN FRINGE AREAS

The IF response curve as widened by adding a .47MMF capacitor across the second IF transformer (L17).

WESTINGHOUSE MODELS H-736T17, H-738T17 (Ch. V-2227-1)



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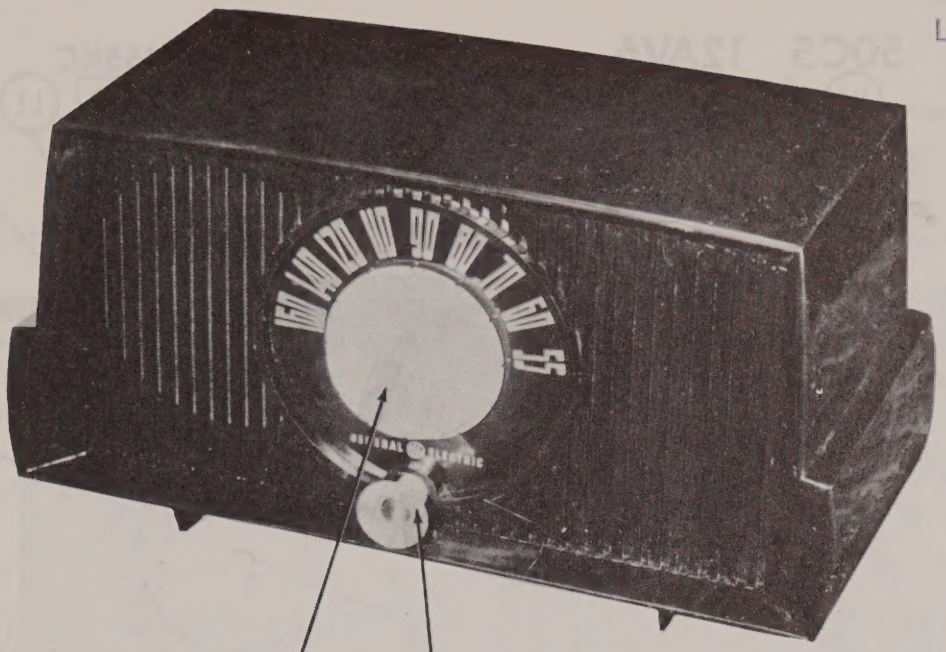

GENERAL ELECTRIC
MODELS 424, 425

TRADE NAME	General Electric Models 424, 425
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Part, Syracuse, N.Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 1 (grid) of 12BA6 (V2). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to pin 1 (grid) of 12BE6 (V1). Low side to B-.	"	"	"	A3, A4	"
3.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1500KC	Tune to 1500KC signal	"	A6	Adjust for maximum deflection while rocking tuning gang thru 1500KC signal.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		General Electric PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	RCE-160	PRS150/50-50		BBRD5515		2N521	TVA-2453	Red
B	50	150								Yellow
C2	.05	400	UCC-045	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	47		RCW-3075							
C4A	400		♦RCW-3048	SI401	D6-401		GP2K-391	UC-5339	5GA-T4	
B	2000			BPD-002	DD-202		812-002	DC-522	5HK-D2	
C	220			SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
D	5000			BPD-005	DD-502		812-005	DC-525	5HK-D5	
C5	.022	600	RCN-050	P688-022	DF-203	PTE6S22		PT6122	6TM-S22	
C6	.047	600	RCN-053	689ZX-047		PTE6S47		PT6147	6TM-S47	
C7	.05	400	UCC-045	P488-05		PTE4S5		PT415	4TM-S5	
C8	.01	200	UCC-040	P288-01	DD-103	PTE4S1	GP2-333-103	PT411	4TM-S1	

♦ Items C4A, C4B, C4C and C4D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	RRC-205	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

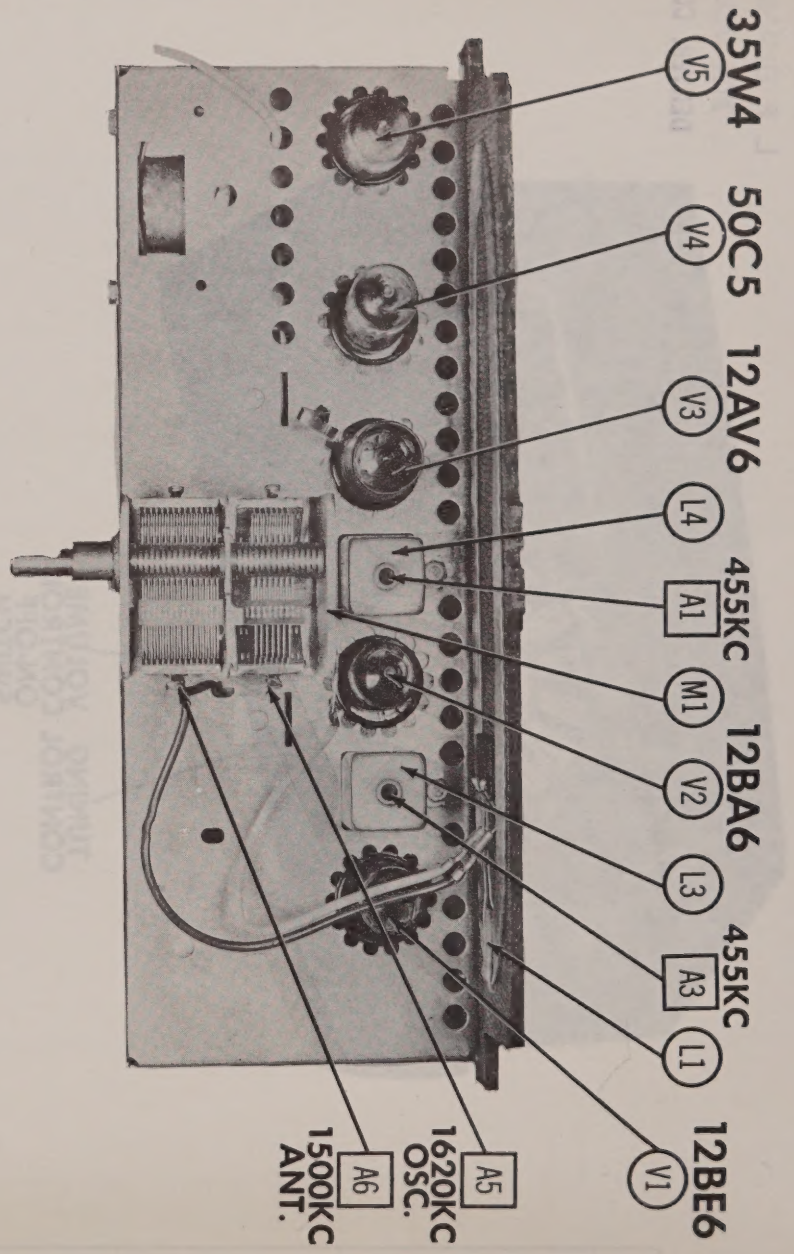
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R2	22KΩ	½	URD-081	BTS-22K	
R3	100Ω	½	URD-025	BTS-100	
R4	100KΩ	½	URD-097	BTS-100K	
R5	68Ω	½	URD-021	BTS-68	
R6	2.2Meg	½	URD-129	BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R7	6.8Meg	½	URD-141	BTS-6.8Meg	
R8	470KΩ	½	URD-113	BTS-470K	
R9	470KΩ	½	URD-113	BTS-470K	
R10	150Ω	½	URD-029	BTS-150	
R11	1500Ω	2	URF-053	BTB-1500	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		General Electric PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.6KΩ	3.5Ω	232Ω	.48Ω	RTO-128	A-3332	A-3025	Z1101	S-1X ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	General Electric PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.5Ω	S403D7	ST-113 (Mod. P4-X)	4A07	

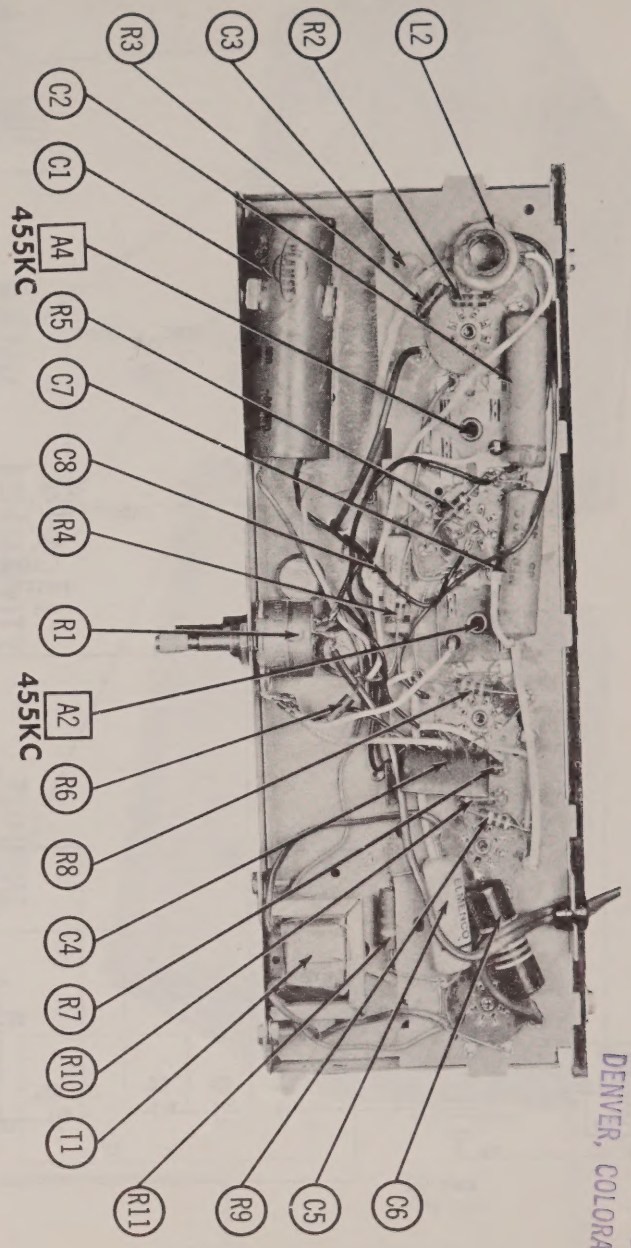
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.9Ω		RAB-205				Includes cabinet back
L2	Osc. Coil	.5Ω	6.5Ω	RCC-122	14-1074		70-Osc.	
L3	Input IF	12Ω	12Ω	RTL-143	16-6758	BC-352	12-C1	
L4	Output IF	14Ω	13Ω	RTL-143	16-6758	BC-353	12-C2	

MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M1	Tuning cap	RCT-066	2 section (40-472MMF, 22-150MMF)
	Cabinet	RAU-377	Ivory, with dial scale-model 425
	Cabinet	RAU-376	Mahogany with dial scale-model 424
	Knob	RDK-295	Ivory off-on volume
	Knob	RDK-306	Ivory tuning

CHASSIS—BOTTOM VIEW



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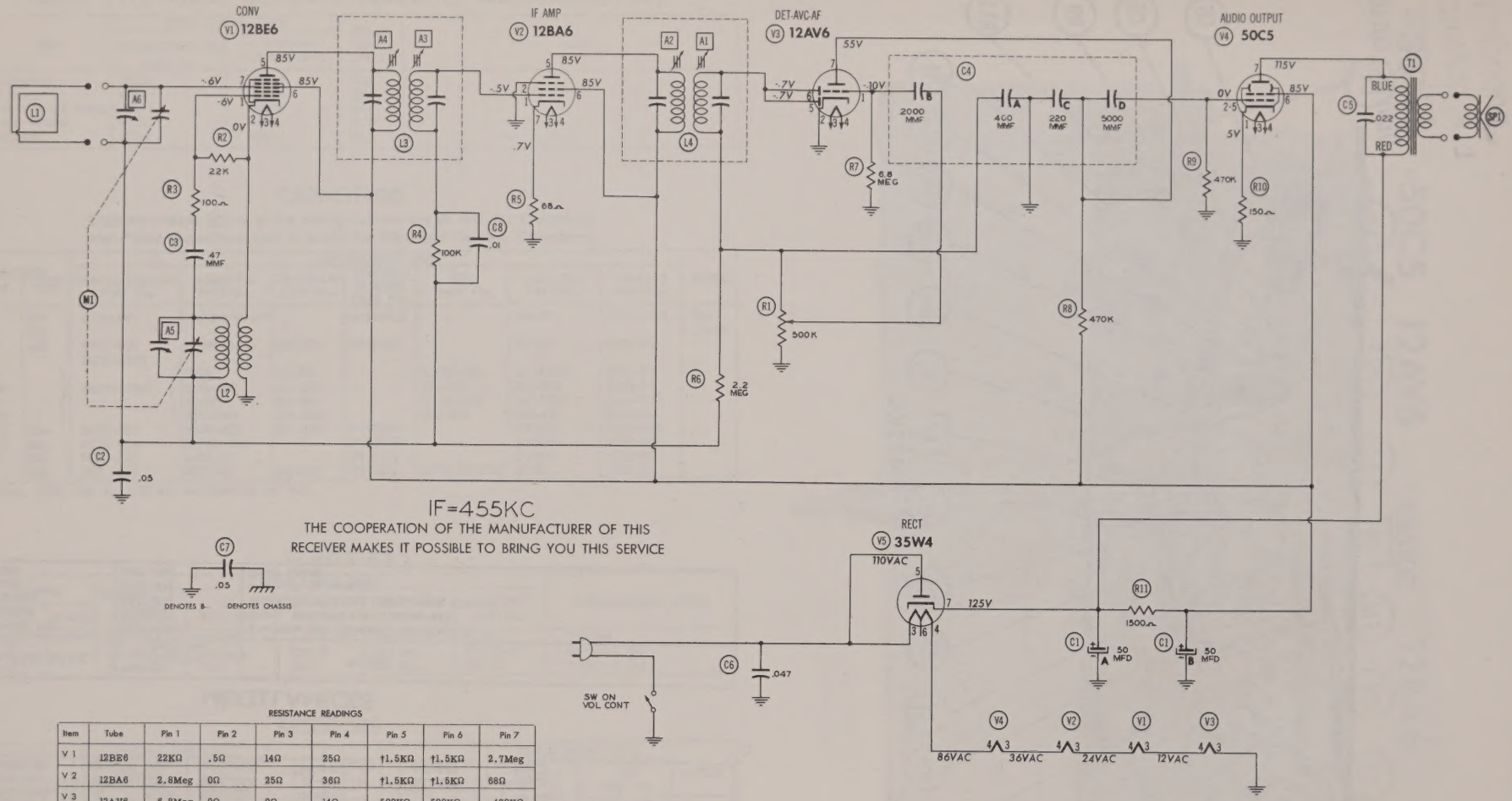
DENVER, COLORADO

GENERAL ELECTRIC
MODELS 424



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

C7 .05 — DENOTES B- — DENOTES CHASSIS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	14Ω	25Ω	†1.5KΩ	†1.5KΩ	2.7Meg
V 2	12BA6	2.8Meg	0Ω	25Ω	36Ω	†1.5KΩ	†1.5KΩ	68Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	14Ω	500KΩ	500KΩ	470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	85Ω	470KΩ	†1.5KΩ	†230Ω
V 5	35W4	100KΩ	INF	90Ω	125Ω	125Ω	118Ω	100KΩ

† MEASURED FROM PIN 7 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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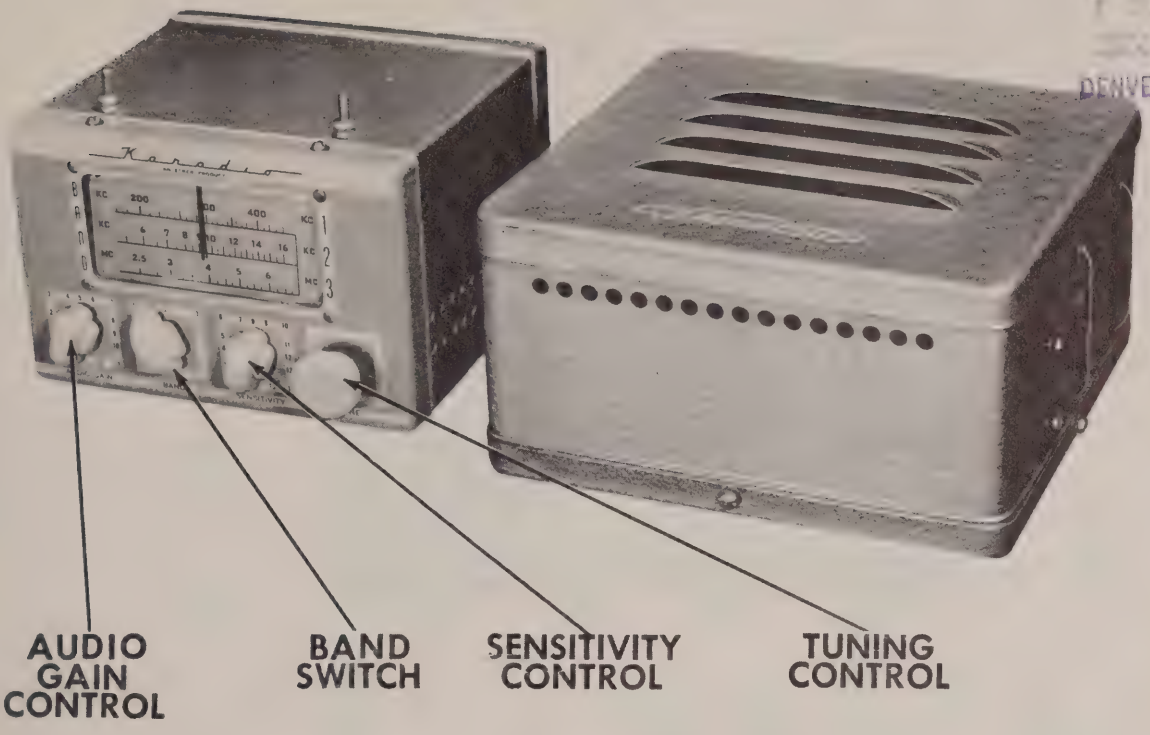
KARADIO
MODEL M80B



KARADIO
MODEL M80B

TRADE NAME	Karadio Model M80B
MANUFACTURER	Eckstein Radio & Tel. Co., Leroy, Minn.
TYPE SET	Battery Operated Mobile 3 Band Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X5 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 4 Amp. @ 6.3 Volts DC
TUNING RANGE–	Band 1 (190-420KC), Band 2 (540-1650KC), Band 3 (2.5-6.8MC)

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
With tuning gang fully closed set pointer to extreme left edge of dial scale.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.001MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	470KC (400~Mod)	Band 1	400KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	100MMF	High side to antenna receptacle. Low side to chassis.	400KC	"	"	"	A5	"
3.	"	"	200KC	"	200KC	"	A6	"
4.	"	"	400KC	"	400KC	"	A7, A8	"
5.	"	"	1400KC	Band 2	1400KC	"	A9	"
6.	"	"	600KC	"	600KC	"	A10	"
7.	"	"	1400KC	"	1400KC	"	A11, A12	"
8.	"	"	6MC	Band 3	6MC	"	A13	"
9.	"	"	2.5MC	"	2.5MC	"	A14	"
10.	"	"	6MC	"	6MC	"	A15, A16	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		KARADIO PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BE	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp.	6AV6	6AV6	7BK	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X5	6X5	6S	

CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	KARADIO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	250		AFH2-26		BO21		FP217	TVL-2515	
B	▲20	250								
C2	10	25		PRS25/10		BR102		TC22	TVA-1204	
C3	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C4	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C5	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C6	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C7	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	Note 1
C8	100	500		1468-0001		5W5T1		MC235	1FM-31	
C9	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C10	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C11	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C12	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C13A	200			SI200	D6-201	TM5T2	GP1K-201	UC-532	5GA-T2	
B	200			SI200	D6-201	TM5T2	GP1K-201	UC-532	5GA-T2	
C14	.006	400		P488-006	D6-602	PTE4D6	GP2-333-602	PT426	4TM-D6	
C15	.015	400		P488-015		PTE4S15		PT415	4TM-S15	
C16	500	500		1468-0005		5W5T5		MC245	1FM-35	Note 1
C17	300	500		1468-0003		5W5T3		MC241	MS-33	Note 1
C18	.0056	1600				PTE16D55				Note 2
C19	500	500		1468-0005		5W5T5		MC245	1FM-35	
C20	.5	200		P288-5		PJ2D5		PT405	2TM-P5	
C21	.5	200		P288-5		PJ2D5		PT405	2TM-P5	
C22	.0056	1600				PTE16D55				
C23	15			SI15N750	TCN-15		N750K-150	NT-5415	5TCU-Q15	Note 1
C24	15			SI15N750	TCN-15		N750K-150	NT-5415	5TCU-Q15	Note 1
C25	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	Note 1

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	KARADIO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½		Q13-137	AG-63-Z	B-70-S	U-53	Audio Gain
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch			76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	500KΩ	½		Q11-133	AG-58-S	B-59	U-50	Sensitivity
B	Switch			Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A

Note 1. Not used in all Models.
Note 2. Some Models use an .01MFD @ 600V in this application.

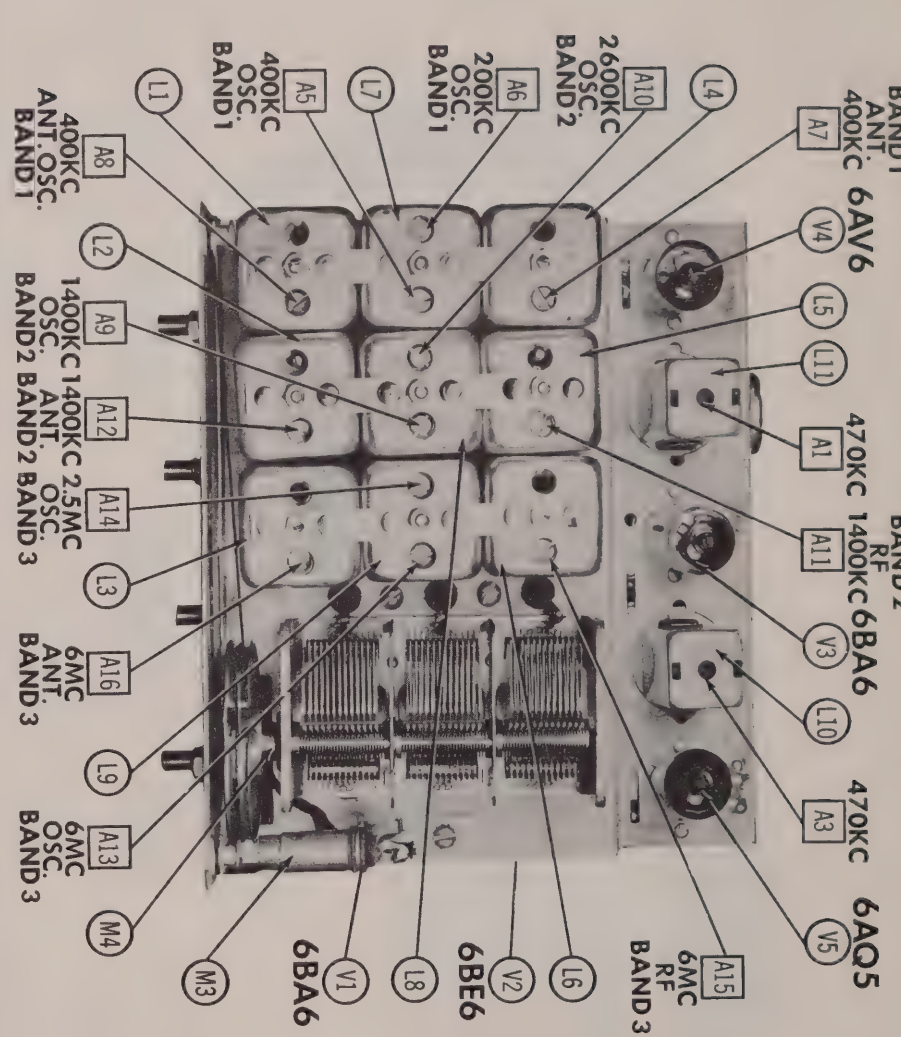
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KARADIO PART No.	IRC PART No.	
R3	1Meg	½		BTS-1Meg	
R4	150Ω	½		BTS-150	
R5	12KΩ	½		BTS-12K	
R6	1Meg	½		BTS-1Meg	Note 1
R7	27KΩ	½		BTS-27K	Note 2
R8	15KΩ	1		BTA-15K	
R9	150Ω	½		BTS-150	
R10	12KΩ	½		BTS-12K	
R11	15KΩ	1		BTA-15K	
R12	1Meg	½		BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KARADIO PART No.	IRC PART No.	
R13	47KΩ	½		BTS-47K	Note 3
R14	10Meg	½		BTS-10Meg	
R15	470KΩ	½		BTS-470K	
R16	470KΩ	½		BTS-470K	
R17	470Ω	1		BTA-470	Note 4
R18	56Ω	½		BTS-56	Note 5
R19	56Ω	½		BTS-56	Note 5
R20	100KΩ	½		BTS-100K	Note 1
R21	220KΩ	½		BTS-220K	Note 1

Note 1. Not used in all models.
Note 2. Some models may use a 25KΩ resistor in this application.
Note 3. Some models may use a 50KΩ resistor in this application.
Note 4. Some models may use a 450Ω resistor in this application.
Note 5. Some models may use a 150Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	KARADIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VCT @ 2.9A	646VCT .042ADC							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		KARADIO PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4.8KΩ	3.2Ω	388Ω	.59Ω		A-3877 ①	A-3019	Z1002	S-5Z	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	KARADIO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"	PM	3.2Ω		ST-108 Mod P6-X	6A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	KARADIO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	35Ω	16Ω					Band 1; 190-420KC
L2	Ant. Coil	30Ω	7Ω					Band 2; 540-1650KC
L3	Ant. Coil	3.8Ω	1.5Ω					Band 3; 2.5-6.8MC
L4	RF Coil	52Ω	16Ω					Band 1
L5	RF Coil	50Ω	7Ω					Band 2
L6	RF Coil	7Ω	2Ω					Band 3
L7	Osc. Coil	1.9Ω	12Ω					Band 1
L8	Osc. Coil	.6Ω						Band 2
L9	Osc. Coil	.4Ω						Band 3
L10	Input IF	17Ω	17Ω	LIFT-67	16-6758 †	BC-352 †	12-C1 †	
L11	Output IF	17Ω	17Ω	LIFT-67	16-6758 †	BC-353 †	12-C2 †	
L12	Vibrator Hash Choke	0Ω					5221	6 Microhenries
L13	Fil. Choke	0Ω					5221	7 Microhenries
L14	Vibrator Hash Choke	0Ω					5221	7 Microhenries
L15	RF Choke	3.1Ω						

† Tune to 470KC.

FILTER CHOKE

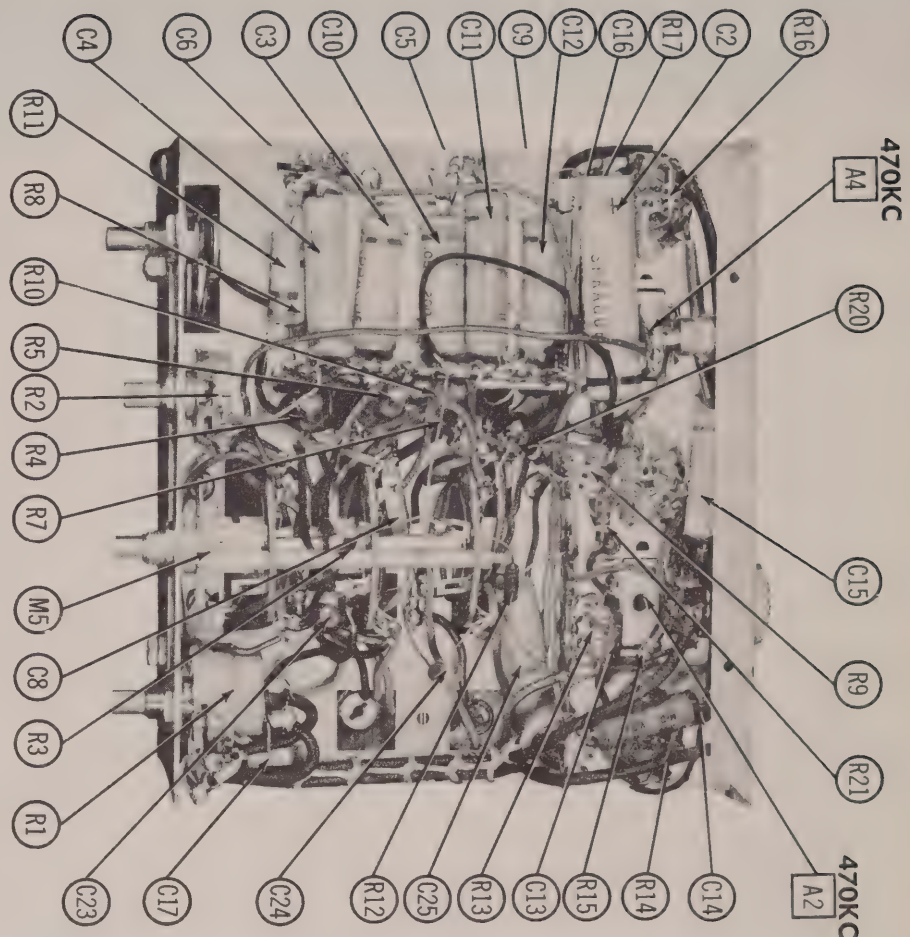
ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	KARADIO PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.
L16	.042ADC	404Ω	9.5HY		C1215	C-2981	C5010	C-3X

① Drill one new mounting hole.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				KARADIO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115~		5301	859	5301	

CHASSIS—BOTTOM VIEW



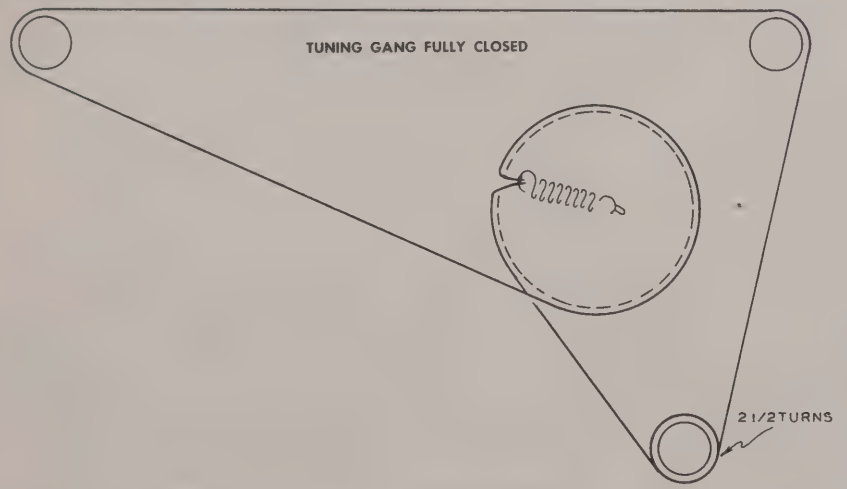
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			KARADIO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	10A			311010. (3AG-10A)	155020	AGC10	HDJ

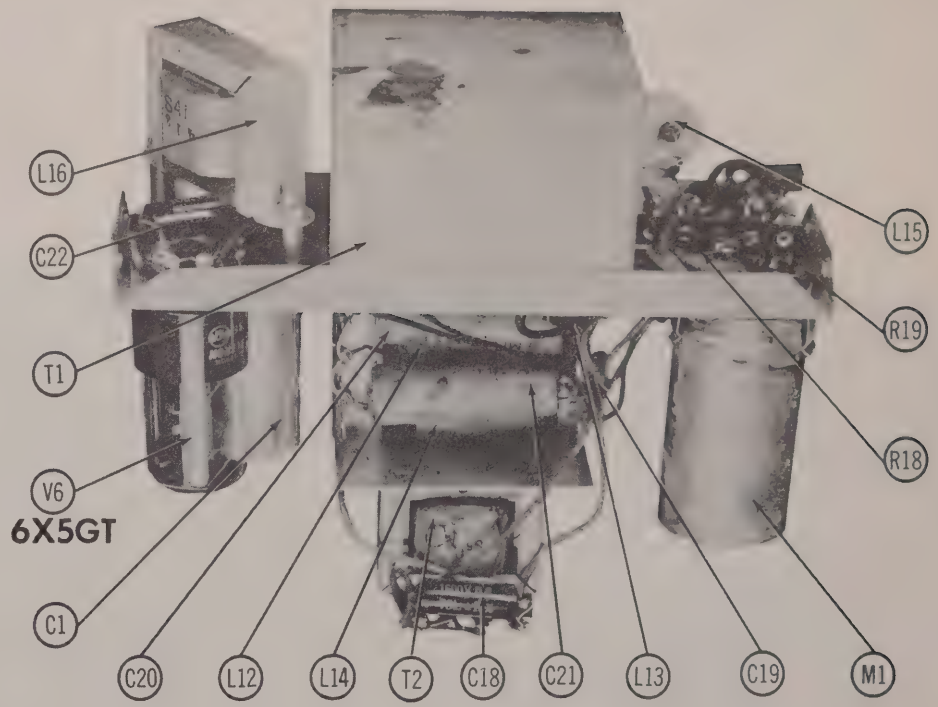
MISCELLANEOUS

ITEM No.	PART NAME	KARADIO PART No.	NOTES
M3	Dial light		# 47 bayonet
M4	Tuning cap		3 section (12-39MMF each)
M5	Switch		Band selector



DIAL CORD STRINGING

POWER CHASSIS



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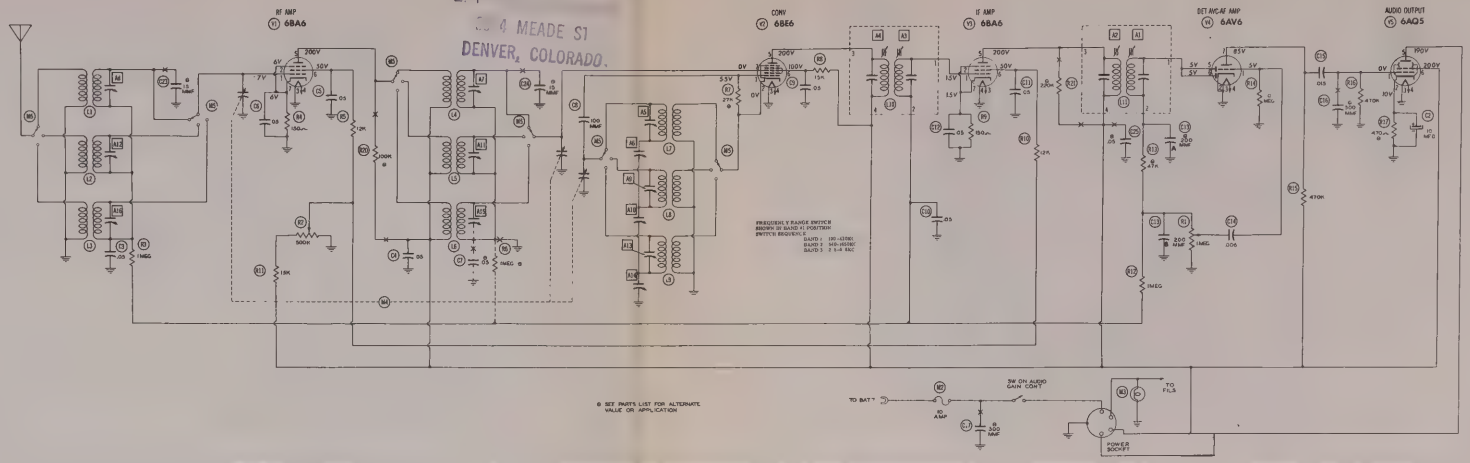

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

IF = 470KC

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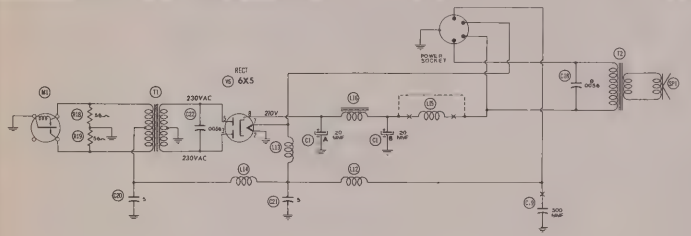

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Set volume control at maximum and line voltage normal.
3. Socket connections are shown as bottom view.
4. Measured from pin to chassis ground with positive lead of meter.
5. Battery voltage maintained at 6 volts for voltage readings.
6. Resistor tolerance on components is ±10% unless otherwise specified. Capacitor tolerance on marked values is ±20%.
7. Values marked (†) are approximate, as signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	3Meg	150Ω	0Ω	.3Ω	†410Ω	†30KΩ	150Ω	
V 2	6BE6	25KΩ	.6Ω	0Ω	.3Ω	†410Ω	†15KΩ	7Ω	
V 3	6BA6	2Meg	150Ω	.1Ω	0Ω	†410Ω	†30KΩ	150Ω	
V 4	6AV6	10Meg	0Ω	0Ω	.1Ω	1Meg	1Meg	†470KΩ	
V 5	6AQ5	470KΩ	450Ω	0Ω	.1Ω	†800Ω	†410Ω	470KΩ	
V 6	6X5	0Ω	0Ω	320Ω	INF	360Ω	360Ω	.3Ω	600KΩ

ALL MEASUREMENTS ON STANDARD BROADCAST BAND
† MEASURED FROM PIN 7 OF V6

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MAJESTIC
SERIES 112, 112-2, 113

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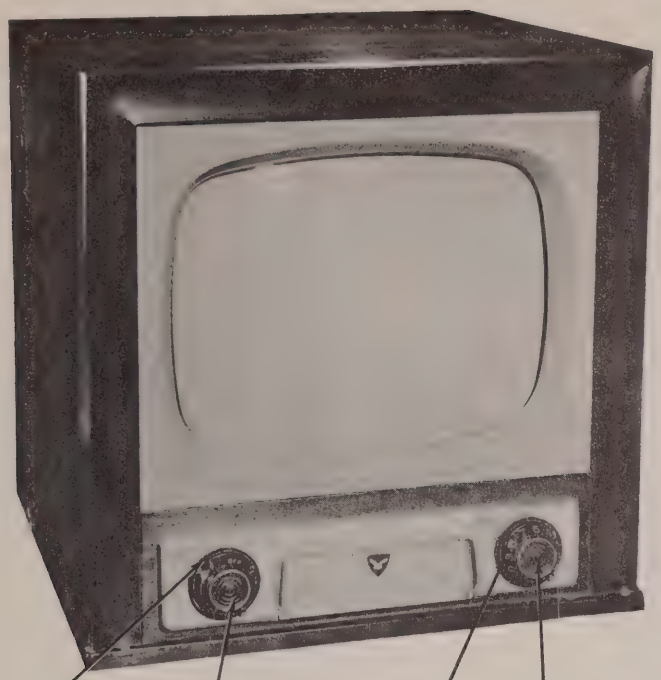

MAJESTIC SERIES 112

TRADE NAME	Majestic Series 112, 112-2, 113
MANUFACTURER	Majestic Radio & TV, Div. of Wilcox-Gay Corp., 70 Washington St., Brooklyn, N.Y.
TYPE SET	Television Receiver
TUBES	Ninteen
POWER SUPPLY	110-120 Volts AC-60 cycle RATING 1.52Amp. @ 117 volts AC
TUNING RANGE—	Channels 2 thru 13, Video IF 24.75MC, Sound IF 20.25MC (Intercarrier)

INDEX

Alignment Instructions 6,7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Discriptions 14, 15, 16
Photographs
Cabinet - Rear View 11
Capacitor Identification 4,9
Chassis - Top View 3
RF Tuner 10
Resistor Identification 19, 20
Photographs (Cont)
Trans., Inductor and Alignment Identification 13
Resistance Measurements 8
Servicing in the Field 18
Schematic 2
Trouble Shooting Aids 12,17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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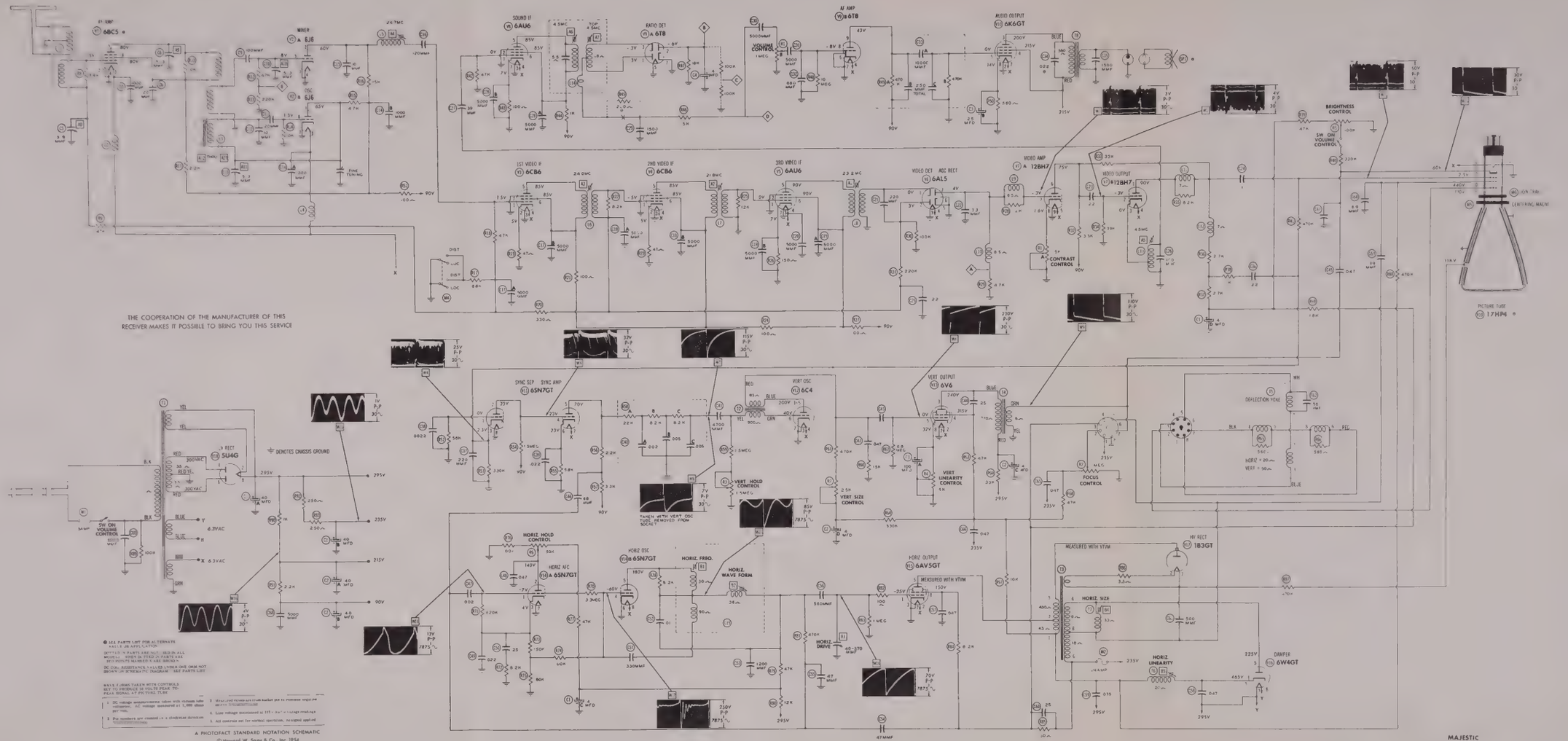
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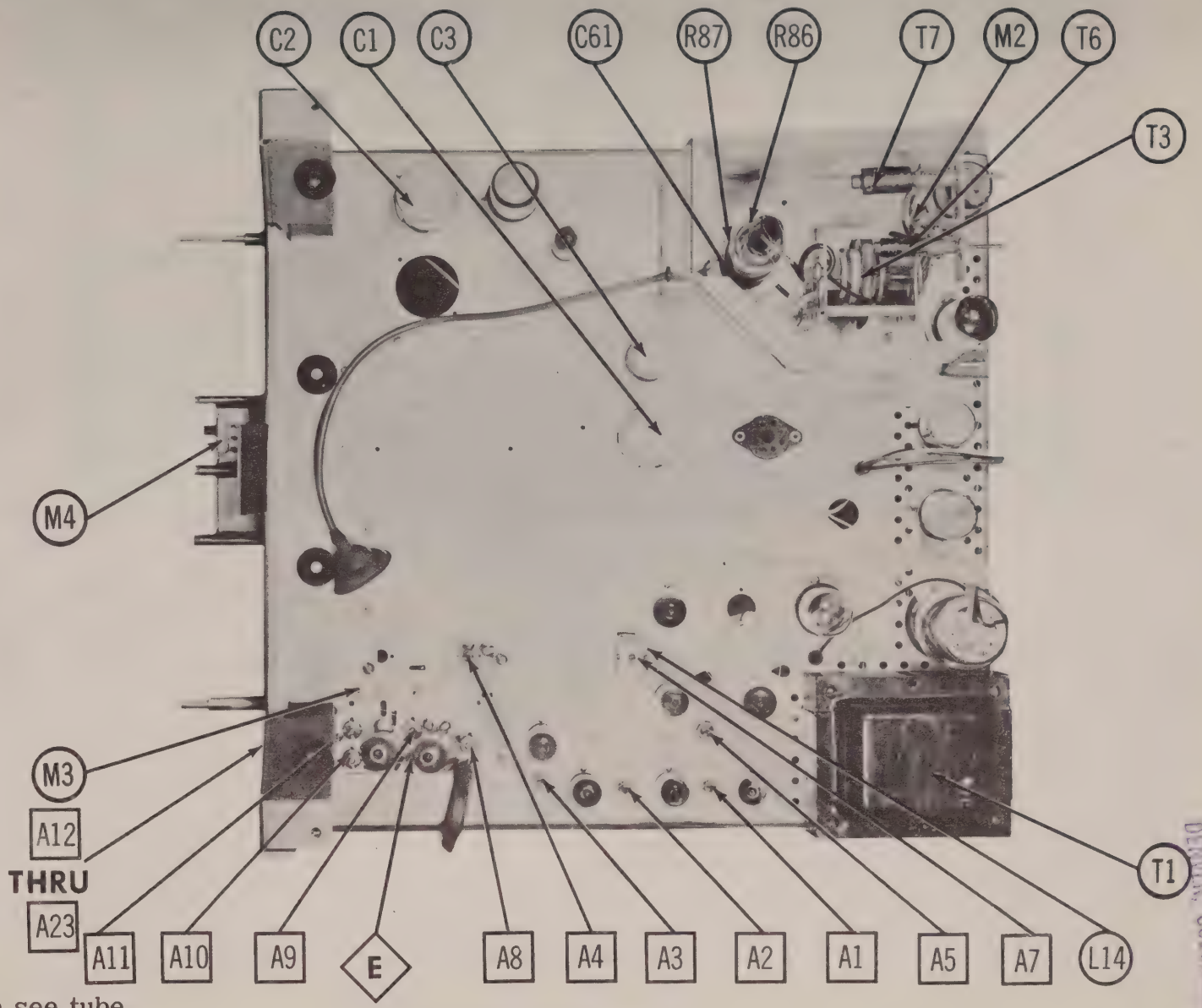

For tube location see tube placement chart page 5.

CHASSIS TOP VIEW

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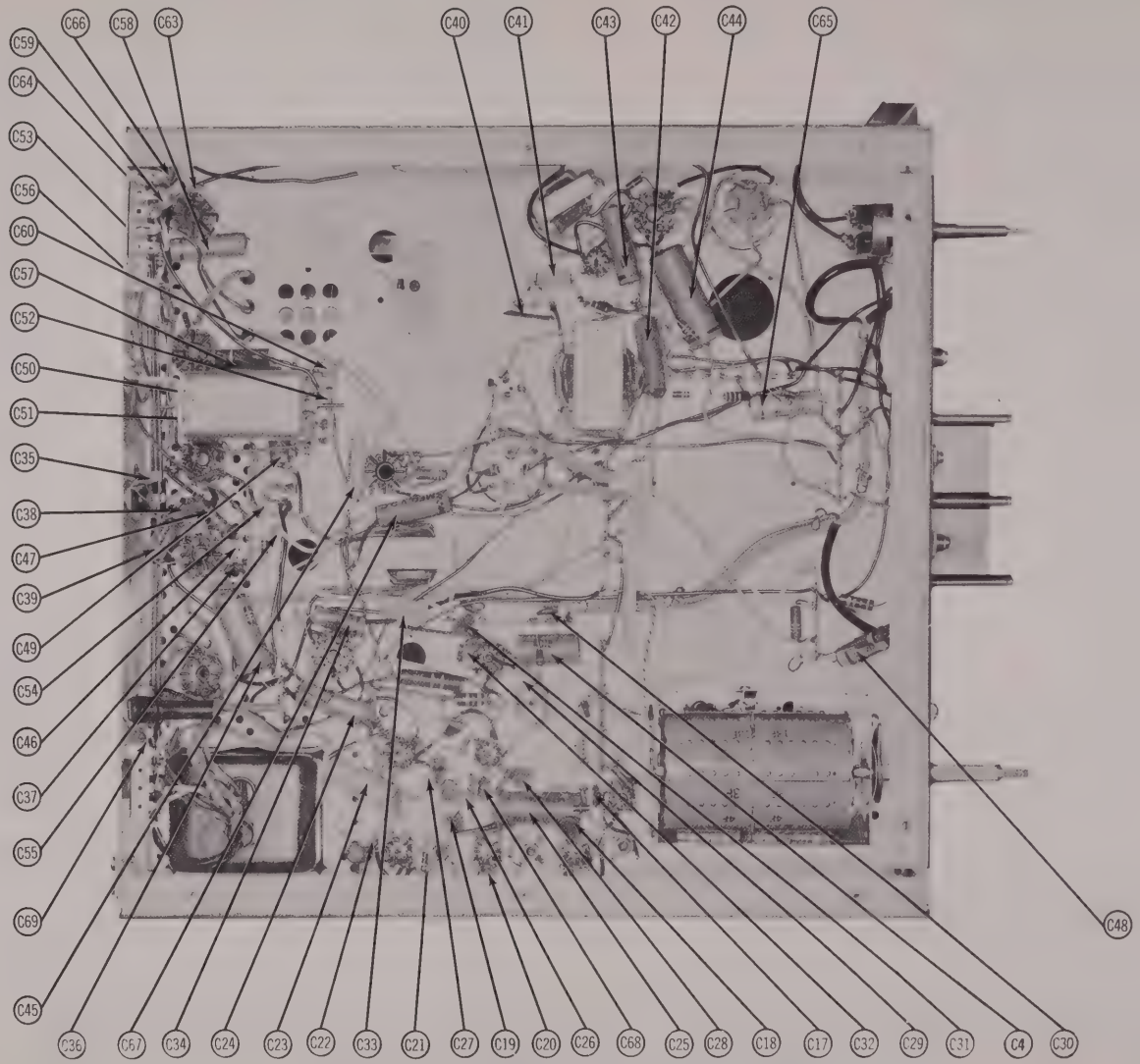

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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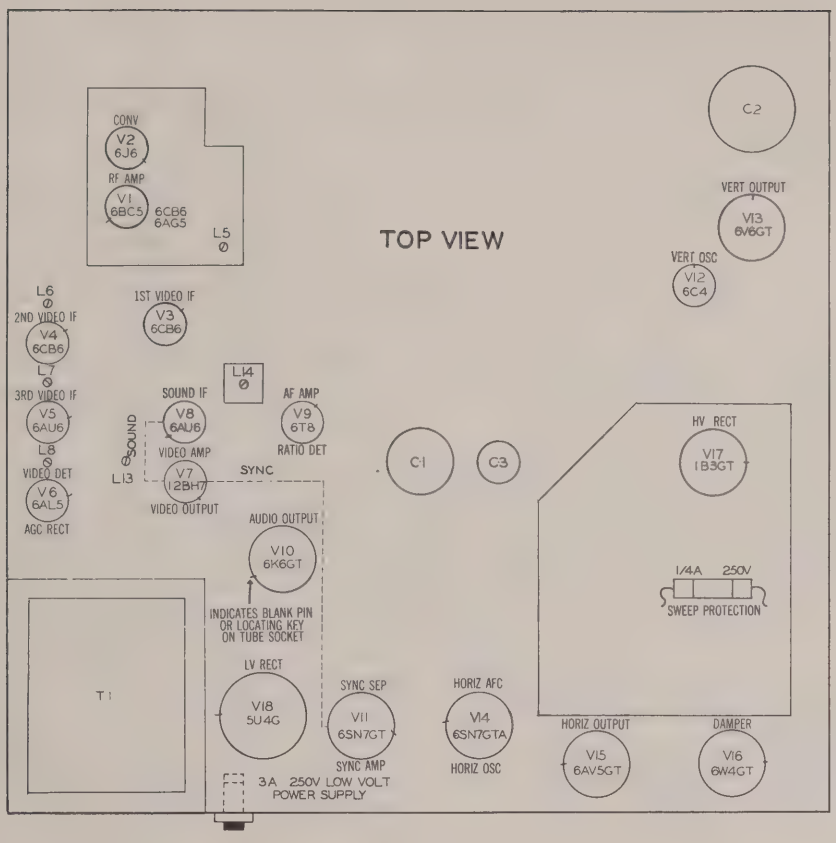
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V18, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V7
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V19
Has pic, no sound - V8, V9, V10

SYNC FAILURE
No vert. sync - V11, V12
No horiz. sync - V11, V14
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V19 Fuse (M2)
No vertical deflection - V12, V13
Poor vert. linearity or foldover - V12, V13
Poor horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V17, V18
Vert. off freq. - V11, V12
Horiz. off freq. - V11, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed.
This will disable the local oscillator and reduce the possibility of erroneous indication.
Connect the negative lead of a 3 volt battery to the ungrounded side of C17A. Connect the positive lead to chassis.
Set the contrast control maximum counter clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23.2MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain not more than 1.5 volts at VTVM.
2.	"	"	21.8MC	"	"	A2	"
3.	"	"	24.0MC	"	"	A3	"
4.	"	"	24.7MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis	23MC (10MC Swp)	20.25MC 21.75MC 24.75MC	Any	Vert. amp. thru 10KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.0015MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A5, A6	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point (D). Common to point (C)	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUNDIF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.0015MFD	High side to point (A). Low side to chassis.	4.5MC (450 KC Swp)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C4. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
7.	"	"	"	"	"	Vert. amp. to point (D). Low side to chassis.	A7	Reconnect stabilizer capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of cross over lines.

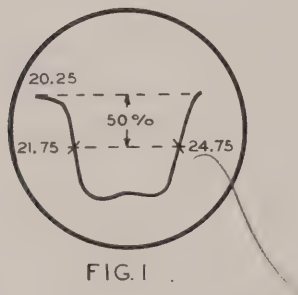


FIG. 1

FIG. 2

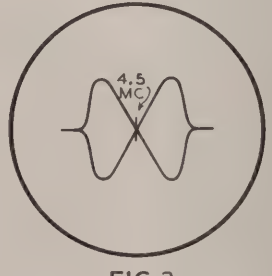


FIG. 3

24.75

ALIGNMENT INSTRUCTIONS (cont)

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RF AND MIXER ALIGNMENT

Remove bias battery used in video-IF alignment and connect a short across C17A.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A8, A9, A10	Adjust for response curve similar to Fig. 4 with markers at not less than 70%.
9.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check all channels for proper marker placement. If markers fall below 70% on any channel make SLIGHT compromise adjustments of A8, A9 and A10 with channel selector set for that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency, approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A11. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A11 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel selector switch is turned to each channel.
Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker as shown in Fig. 5. Video marker should be at 50% response.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

FIG.4

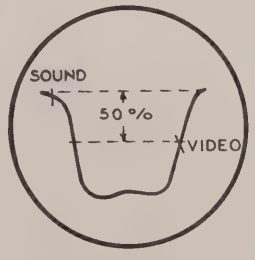
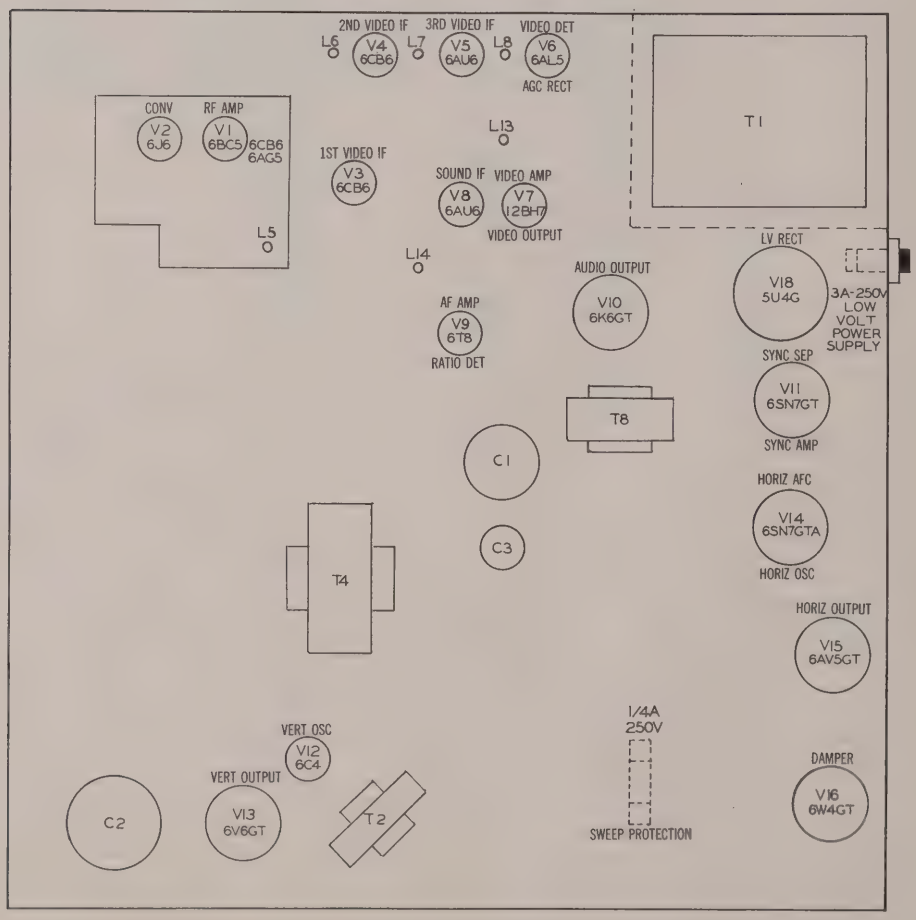


FIG.5

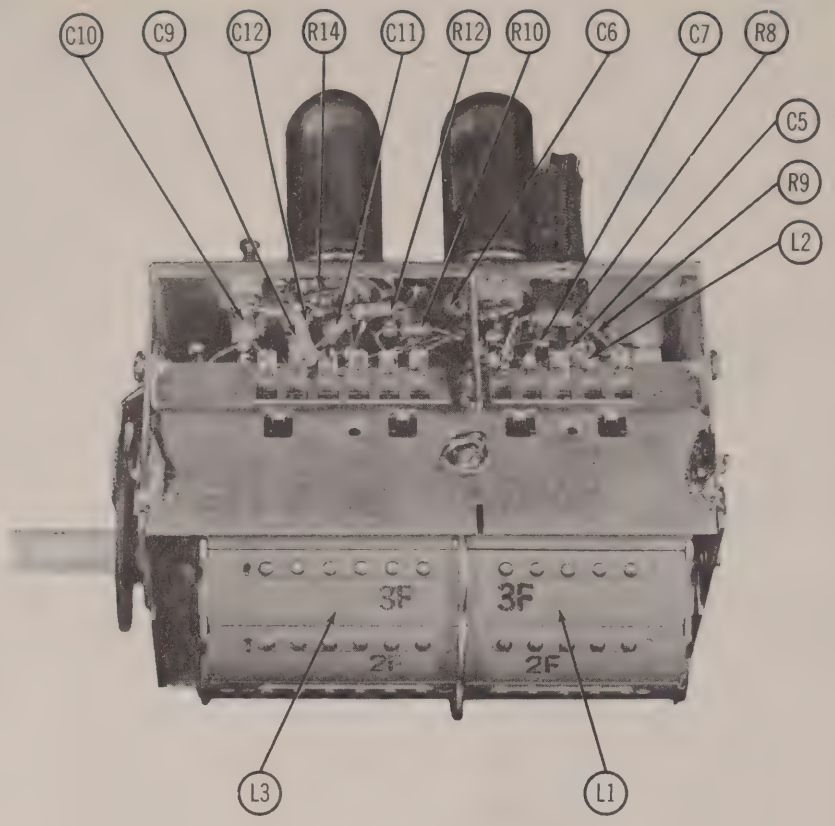
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	370KΩ	0Ω	.1Ω	0Ω	† 5.5KΩ	† 5.5KΩ	0Ω		
V 2	6J6	† 8KΩ	† 18.5KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	325KΩ	47Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	0Ω		
V 4	6CB6	320KΩ	47Ω	0Ω	.1Ω	† 3.4KΩ	† 3.4KΩ	0Ω		
V 5	6AU6	.4Ω	0Ω	0Ω	.1Ω	† 3.3KΩ	† 3.3KΩ	150Ω		
V 6	6AL5	.4Ω	100KΩ	.1Ω	0Ω	0Ω	0Ω	4.7KΩ		
V 7	12BH7	† 7.8KΩ	39KΩ	.2Ω	.1Ω	.1Ω	† 6.2KΩ	4.7KΩ	300Ω	0Ω
V 8	6AU6	47KΩ	0Ω	0Ω	.1Ω	† 4.2KΩ	† 4.2KΩ	100Ω		
V 9	6T8	INF	18KΩ	INF	.1Ω	0Ω	0Ω	0Ω	10Meg	† 470KΩ
V 10	6K6GT	INF	0Ω	† 1.6KΩ	† 1KΩ	470KΩ	† 1KΩ	.1Ω	560Ω	
V 11	6SN7GT	56KΩ	† 1.5Meg	330KΩ	† 1.5Meg	† 9.2KΩ	5.6KΩ	.1Ω	0Ω	
V 12	6C4	▲ 1.3Meg	0Ω	0Ω	.1Ω	▲ 1.3Meg	2.3Meg	0Ω		
V 13	6V6GT	INF	.1Ω	† 4KΩ	▲ 57KΩ	6.8Meg	INF	0Ω	2.2KΩ	
V 14	6SN7GT	1.1Meg	† 70KΩ	330KΩ	280KΩ	† 60KΩ	0Ω	0Ω	.1Ω	
V 15	6AV5GT	1Meg	.1Ω	0Ω	INF	▲ 63Ω	INF	0Ω	† 9KΩ	
V 16	6W4GT	† 515Ω	INF	1.2Meg	INF	† 520Ω	INF	† 500Ω	† 500Ω	
V 17	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲ 490Ω
V 18	5U4G	INF	70KΩ	INF	35Ω	† 500Ω	33Ω	† 500Ω	70KΩ	
V 19	17HP4	0Ω	800KΩ	PIN 6 ▲ 1Meg	PIN 10 ▲ 470KΩ	PIN 11 † 470KΩ	PIN 12 .1Ω			

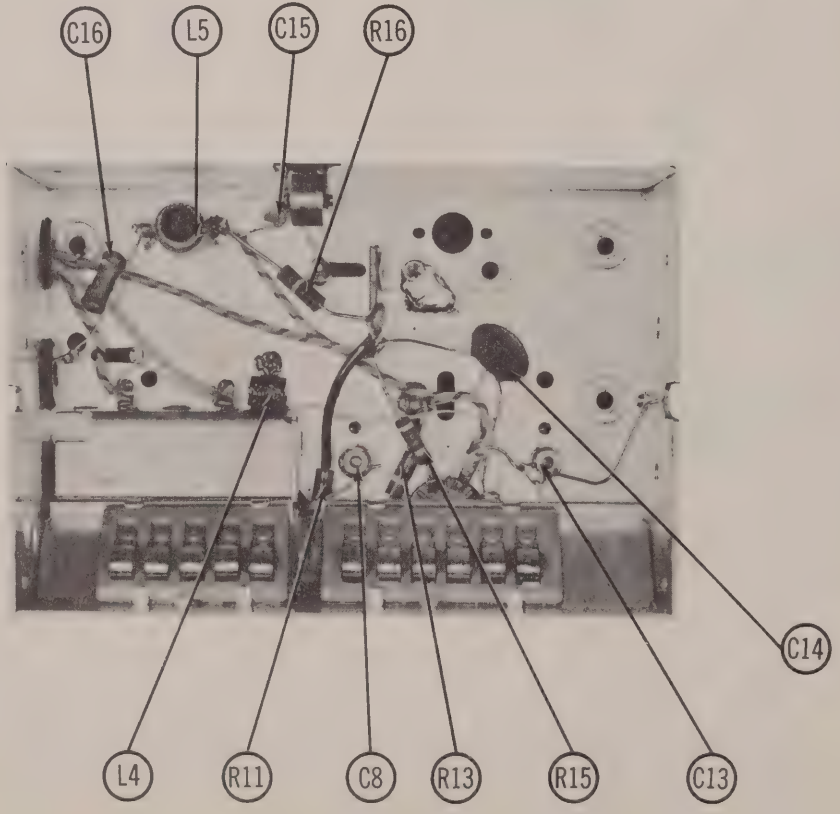
▲ MEASURED FROM PIN 3 OF V16.
† MEASURED FROM PIN 8 OF V18.



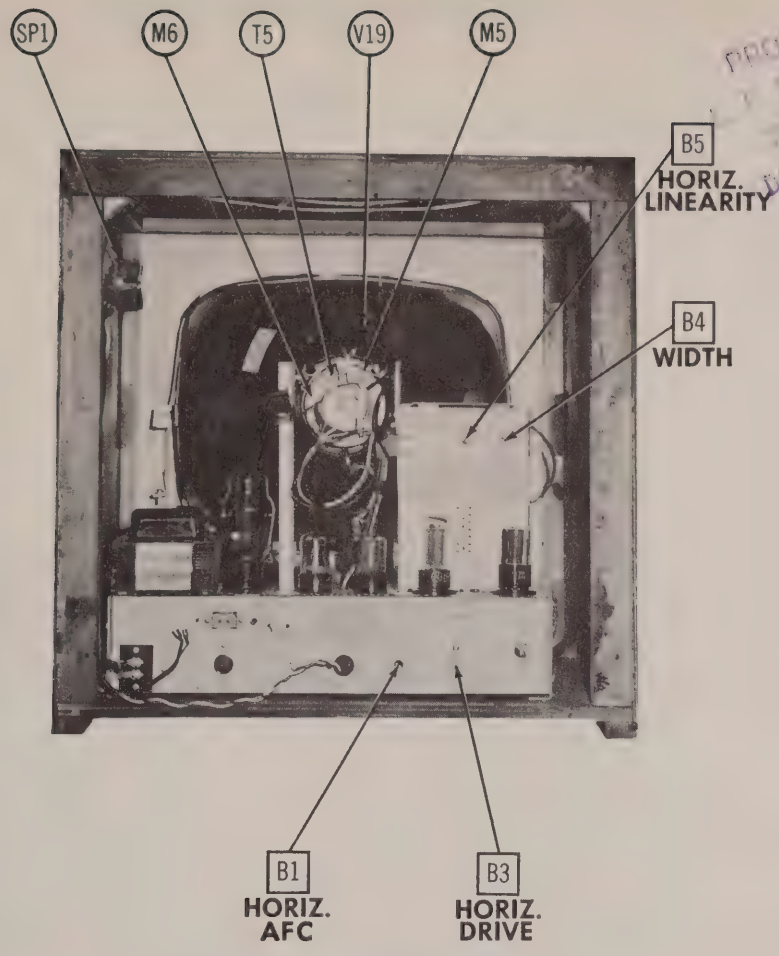
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

PROPERTY OF
DENVER, COLORADO

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Turn the contrast control to its mid-poistion. Turn the horizontal hold control fully counter clockwise.

If the picture is out of sync, adjust the horizontal frequency slug, B1, until the picture synchronizes. Momentairly interrupt the signal by switching off channel, then back. The picture should just fall out of sync. If it does not, turn B1 slughtly clockwise, and again interrupt the signal. Continue this procedure until the picture just falls out of sync only when signal is interrupted. Rotate the horizontal hold control clockwise until picture falls into sync. The picture should remain in sync throughout most to the range of the horizontal hold control. If the picture does not hold sync it may be necessary to adjust the horizontal waveform slug, B2. Connect the vertical amplifier of an oscilloscope through 10KΩ to terminal "C" of L15. Connect the low side to chassis. If necessary, adjust B2 to obtain waveform similar to Fig. 6.

During adjustment of B2 keep picture in sync by adjusting B1.

Adjust the horizontal drive trimmer, B3, counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the horizontal size slug (B4) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B5) for a picture that is symmetrical from left to right.

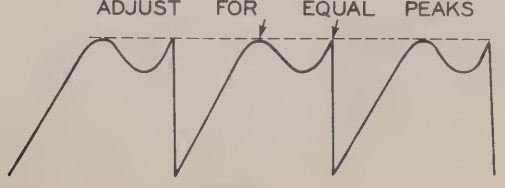


FIG. 6

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V14, V15, V16 and V18. Check adjustments B3, B4, and B5. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check C57, C58, C59, C60, R84, T3, T5A and other associated components.	Check R83, C56 and other associated circuit components.

DRIVE LINES

Check adjustment B3. Check by substitution V14, V15 and V16. Check C52, C53, C56, C57, C58, C59, T3, T5A and other associated circuit components.

COMPRESSED LEFT SIDE

Check by substitution V14, V15 and V16. Check adjustments B3, B4 and B5. Check components associated with the horizontal output and damper circuits especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Substitute V15 and V16. Check T3, T6, T7 and other associated components.

XMAS TREE EFFECT

Substitute V14. Check L15, R77, R79, C51, C52, C53 and other associated components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Check by substitution V12 and V13. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R63, R94 and other associated circuit components.	Check R62, C43, T2 and other associated circuit components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V12 and V13. Check T4, T5B, C3A and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V12 and V13. Check R62, C42, C43, T2 and other associated circuit components.

FOLDS

Substitute V12 and V13. Check associated components for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Substitute V11. Check associated circuit components especially C36.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Check by substitution V11 and V12. Check waveform W6.

If Satisfactory	If Unsatisfactory
Check components associated with V12.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V14. Check associated circuit components especially C51, C56, C48, C47 and C46.

HORIZONTAL BENDING

Substitute V14 and V15. Check horizontal AFC filter network (C49, C50, R71, R72) for failure or change of value.

VIDEO

LOSS OF VIDEO

Check by substitution V6 and V7. Check picture tube and other associated circuit components.

SOUND BARS (4.5MC BEAT)

Check tuner fine tuning. Check video IF alignment.

POOR CONTRAST

Check by substitution V6 and V7. Check picture tube. Check contrast control and other associated components.

NEGATIVE PIX

Substitute V6 and V7. Check AGC network for proper operation. Check picture tube.

SMEAR

Substitute V6 and V7. Check C23, C24, R32, R34, R36, R37, R41, L9, L11, picture tube and other associated circuit components.

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5, V6 and V7 for heater to cathode leakage. Check B+ filter capacitors for open.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9 and V10. Check stages V9B and V10 using audio signal generator. Apply audio signal across R48.

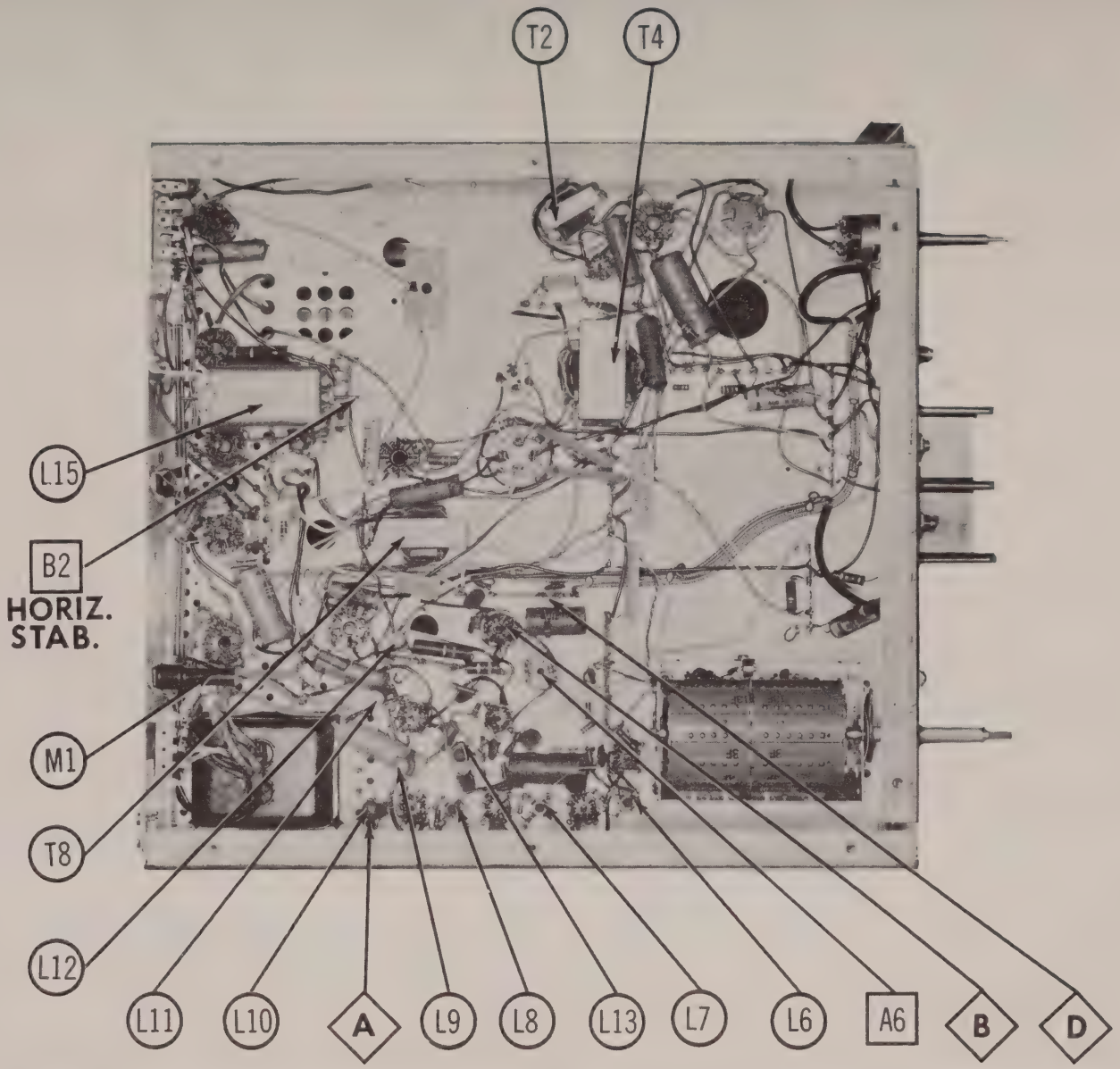
If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V9B and V10.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A7 for minimum buzz. If still unsatisfactory, substitute V9 and radjust A6 and A7.

DISTORTED

Follow procedure outlined under "Weak or No sound".



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. A. SCHMOLESKIE
3124 MAGNOLIA ST
DENVER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA: MAJESTIC PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1A	RF Amplifier	6BC5	6BC5	7BD	
B	RF Amplifier	6CB6	6CB6	7CM	
C	RF Amplifier	6AG5	6AG5	7BD	
V3	Converter	6J8	6J8	7BJ	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Detector - AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Amplifier - Video Output	12BH7	12BH7	9A	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector - AF Amplifier	6T8	6T8	9E	
V10	Audio Output	6K8GT	6K8GT	7S	
V11	Sync Separator - Sync Amplifier	6SN7GT	6SN7GT	8BD	
V12	Vert. Oscillator	6C4	6C4	6BG	
V13	Vert. Output	6V6GT	6V6GT	7S	
V14	Horiz. AFC - Horiz. Osc.	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6AV5GT	6AV5GT	6CK	
V16	Damper	6W4 GT	6W4 GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	8T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: MAJESTIC PART No	SYLVANIA PART No	GENERAL ELECTRIC PART No	WESTINGHOUSE PART No	RETMA BASE TYPE	NOTES
V19	17HP4	17HP4 17RP4	17HP4 17RP4	17HP4	12L 12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	MAJESTIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	C-5.435-3	E4D415		DO15		FP376.8 TC79	R1320	
B	■60	450								
C	▲4	450								
D	◆	450								
C3A	▲40	450	C-5.435-3	E4D415		DO15		FP376.8 TC70	R1320	
B	■60	450								
C	▲4	450								
D	◆	450								
C3A	■100	50	C-5.439-2	AFH3-12		CO11		FP229	R1319	
B	▲25	50								
C4	6	50	C-5.430-1	PRS150/4		BH415		TC30	TVA-1402	
C5	3-9				829-10					
C6	120			SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C7	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C8	.5-3				829-3			CT565A		
C9	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C10	.5-3				829-3			CT568A		
C11	30			SI30NP0	TC2-30		NP0K-300	ZT-542	5TCC-Q2	
C12	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C13	.5-3				829-3			CT565A		
C14A	1000			BPD-2X001	DD2-102	TM5DD1	822-001	DCD-521	5HK-2D1	
B	1000									
C15	10			SI10NP0	TC2-10		NP0K-100	ZT-541	5TCC-Q1	
C16	120			SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C17A	5000		B-4.125-1	BPD-2X005	DD2-502	TM5DD5	841-005	DCD-535	5HK-3D5	
B	5000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C18A	5000		B-4.125-1	BPD-2X005	DD2-502	TM5DD5	841-005	DCD-535	5HK-3D5	
B	5000						801-005			
C19A	5000		B-4.125-1	BPD-2X005	DD2-502	TM5DD5	841-005	DCD-535	5HK-3D5	
B	5000						801-005			
C20	5000		B-4.115-1	BPD-005	DD-502	TM5D5	841-005	DC-525	5HK-D5	
C21	220		C-4.109-11	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C22	3.3		C-4.111-5	SI3.3NP0	TCN3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C23	.33	400	D-3.105-23	P488-33		PTK4P33		PT4022	4TM-P33	
C24	.1	400	D-3.105-21	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C25	.22	400	D-3.105-23	P488-23		PTK4P22		PT4022	4TM-P22	
C26	100	500	C-4.104-38	1469-0001		SR7T1		MCB235	MS-31	
C27	39	500	D-4.104-21	1469-00004		5R5Q4		MCK223	MS-44	
C28A	5000		B-4.125-1	BPD-2X005	DD2-502	TM5DD5	841-005	DCD-535	5HK-3D5	
B	5000						801-005			
C29	1500		D-4.106-12	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C30	5000		B-4.115-1	BPD-005	DD-502	TM5D5	841-005	DC-525	5HK-D5	
C31	5000		B-4.115-1	BPD-005	DD-502	TM5D5	841-005	DC-525	5HK-D5	
C32	680		C-4.109-5	SI680	D6-681		GP2K-681	UC-5388	5GA-T88	
C33A	10000		*B-10.103	*PA-112-3	*PC-80		*1404-01		*102C1	
B	250									
C	◆									
C34	.022	400		P488-022		PTE4S22		PT4122	4TM-S22	Note 1
C35	1500		D-4.106-12	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5GA-D15	
C36	.22	400	D-3.105-23	P488-22		PTE4P22		PT4022	4TM-P22	
C37	220		C-4.109-11	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C38	.0022	400	D-3.105-12	P488-0022	D6-222	PTE4D22	GP2-333-223	PT4122	4TM-D22	
C39	.022	400	D-3.105-17	P488-022		PTE4S22		PT4122	4TM-S22	
C40A	3000					TM5D2		DC-522		
B	3000		◆B-10.101	◆PA-110	◆PC-100	TM5D5	◆1405-01	DC-525	◆101C1	
C	5000					TM5D5		DC-535		
C41	4700	500	D-4.105-24	1464-005		1DR5D5		MCE465	MS-35	
C42	.047	600	D-3.105-34	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C43	.1	400	D-3.105-21	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C44	.25	600	D-3.100-32	P688-25		PTE6P25		PT6025	6TM-P25	

PARTS LIST & DESCRIPTION

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	MAJESTIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No	SPRAGUE PART No	NOTES
C45	.047	400	D-3.105-19	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C46	68	500	D-4.104-93	1469-00007		5R5Q7			MS-47	
C47	.002	600	D-3.105-26	P688-002	D5-302	PTE6D2	GP2-333-302	PT622	6TM-D2	
C48	.047	400	D-3.105-19	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C49	.022	200	D-3.105-17	P288-022		PJE2S22		PT4123	2TM-S22	
C50	.25	200	D-3.100-30	P288-25		PJE2P25		PT4025	2TM-P25	
C51	330	500	D-4.104-59	1479-00035						
C52	.01	600	D-3.105-1							
C53	1200	500	D-4.105-9							
C54	47		D-4.104-14							
C55	47		D-4.104-14							
C56	560	500	D-4.104-70							
C57	.047	600	D-3.105-34	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C58	.047	600	D-3.105-34	P688-047		PTE6S47		PT6147	6TM-S47	
C59	.015	600	D-3.100-46							
C60	.25	200	D-3.100-30	P288-25		PJE2P25		PT4025	2TM-P25	
C61	500	20000	B-4.128	HV20C	TV3-502	M MC-2075	413-501	HV20036A	20DK-T5	
C62	56	2000	B-4.128-6							
C63	39	2000	B-4.129-2							
C64	69	2000	B-4.129-4							
C65	.047	600	D-3.105-34	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C66	.047	600	D-3.105-34	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C67	.1	400	D-3.105-21	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C68	5000		B-4.115-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C69	5000	2000	B-4.138							

Note 1. Some Models use .0047MFD in this application (part #D-3.105-28)

* Items C33A, C33B, C33C, R49A, R49B are combined in one unit.
When replacing items separately C33B and C33C should total 250MMF.

◆ Items C40A, C40B, C40C, R58A, R58B, R58C are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	MAJECTIC PART No.	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1500Ω	½	CS. 230-2	* QJ-495	RTV-444	SBB-569-S	UP152R	Contrast
B	1Meg	½	Not Reg.				UR16A	Attach to R1A
C	Switch		Not Reg.				US37	Attach to R1B
R2A	1Meg	½	CS. 219-6	QU-137	AG-65-S	AB-89	U-54	Focus
B	Shaft		Not Reg.	Not Reg.	FKS-1/4	AK-3	Not Reg.	Attach to R2A
R3A	1.5Meg	½	CS. 229-10	QU-138	AG-85-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Reg.	Not Reg.	KS8-3	AK-4	Not Reg.	Attach to R3A
R4A	5000Ω	2	CS. 206-6	* WK 5000	A43-5000		R5000L	Vert. Linearity wire wound
B	Shaft		Not Reg.	Not Reg.	FKS-1/4		Not Reg.	Attach to R4A
R5A	100KΩ	½	CS. 229-9	QU-128	AG 49-S	AB-40	U-41	Brightness
B	Shaft		Not Reg.	Not Reg.	KS8-3	AK-4	Not Reg.	Attach to R5A
R6A	50KΩ	½	CS. 229-7	QU3-123	AG-46-S	B-32	U-35	Horiz. Hold
B	Shaft		Not Reg.	Not Reg.	RS-2	Not Reg.	Not Reg.	Attach to R6A
R7A	2.5Meg	½	CS. 219-5	QU-239	AG-84-S	AB-85	SU-561	Vert. Size
B	Shaft		Not Reg.	Not Reg.	FKS-1/4	AK-1	Not Reg.	Attach to R7A

◆ Center terminal goes to ground.
† Universal replacement (Mallory exact duplicate Part No. UE2035).
* CONCENTRKIT EQUIVALENT KIT K-3 FOR BASE ELEMENTS & SHAFTS B11-109 & P1-126 (Panel)
B13-137 & R1-210 (Rear) & SWITCH 76-2.

RESISTORS

ITEM No.	RATING: OHMS	WATT	MAJESTIC PART No	IRC PART No.	NOTES
R8	3900Ω	½		BTS-3900	
R9	47KΩ	½		BTS-47K	
R10	10KΩ	½		BTS-10K	
R11	2200Ω	½		BTS-2200	
R12	4700Ω	½		BTS-4700	
R13	220KΩ	½		BTS-220K	
R14	10KΩ	½		BTS-10K	
R15	4700Ω	½		BTS-4700	
R16	15KΩ	½		BTS-15K	
R17	68KΩ	½		BTS-68K	Note 1.
R18	4700Ω	½	D-7.101-44	BTS-4700	
R19	47Ω	½	D-7.101-250	BTS-47	
R20	330Ω	½	D-7.101-237	BTS-330	
R21	100Ω	½	D-7.101-226	BTS-100	
R22	8200Ω	½	D-7.101-55	BTS-8200	
R23	47Ω	½	D-7.101-250	BTS-47	
R24	100Ω	½	D-7.101-226	BTS-100	
R25	12KΩ	½	D-7.101-62	BTS-12K	
R26	150Ω	½	D-7.101-249	BTS-150	
R27	100Ω	½	D-7.101-226	BTS-100	
R28	4700Ω	½	D-7.101-62	BTS-12K	
R29	4700Ω	½	D-7.101-44	BTS-4700	
R30	100KΩ	½	D-7.101-100	BTS-100K	
R31	220KΩ	½		BTS-220K	
R32	3300Ω	½	D-7.101-37	BTS-3300	
R33	33KΩ	½	D-7.101-79	BTS-33K	
R34	39KΩ	½	D-7.101-83	BTS-39K	
R35	8200Ω	½	D-7.101-55	BTS-8200	
R36	2700Ω	½	D-7.103-104	BTS-2700	
R37	2700Ω	2	D-7.103-104	BTS-2700	
R38	1000Ω	½	C-7.101-17	BTS-1000	
R39	47KΩ	½	D-7.101-86	BTS-47K	
R40	330KΩ	½	D-7.101-121	BTS-330K	
R41	470KΩ	½	D-7.101-29	BTS-470K	
R42	47KΩ	½	D-7.101-87	BTS-47K	
R43	100Ω	½	D-7.101-226	BTS-100	
R44	1000Ω	½	D-7.101-17	BTS-1000	
R45	230Ω	½	D-7.101-234	BTS-230	Note 1.
R46	15KΩ	½	D-7.101-66	BTS-15K	
R47	18KΩ	½	D-7.101-89	BTS-18K	
R48	10Meg	½	D-7.101-192	BTS-10-Meg	
R49A	470KΩ	½	* B-10.103	BTS-470K	
B	470KΩ	½		BTS-470K	
R50	560Ω	1	D-7.102-13	BTA-560	
R51	100Ω	1	D-7.101-226	BTS-100	

ITEM No.	RATING: OHMS	WATT	MAJESTIC PART No	IRC PART No.	NOTES
R52	56KΩ	½	D-7.101-90	BTS-56K	
R53	330KΩ	½	D-7.101-121	BTS-330K	
R54	1.5Meg	½	D-7.101-148	BTS-1.5Meg	
R55	5600Ω	½	D-7.101-46	BTS-5600	
R56	2200Ω	½	D-7.101-30	BTS-2200	
R57	3300Ω	½	D-7.101-37	BTS-3300	
R58A	22KΩ	½		BTS-22K	
B	8200Ω	½	◆B-10.101	BTS-8200	
C	8300Ω	½		BTS-8300	
R59	1.5Meg	½	D-7.101-148	BTS-1.5Meg	
R60	15KΩ	½	D-7.101-65	BTS-15K	
R61	470K	½	D-7.101-129	BTS-470K	
R62	6.8Meg	½	D-7.101-185	BTS-6.8Meg	
R63	47KΩ	½	D-7.102-94	BTA-47K	
R64	330KΩ	½	D-7.101-122	BTS-370K	
R65	560Ω	½	D-7.101-5	BTS-560	
R66	560Ω	½	D-7.101-5	BTS-560	
R67	10KΩ	½	D-7.101-59	BTS-10K	
R68	47KΩ	½	D-7.101-87	BTS-47K	
R69	1800Ω	½	D-7.102-34	BTA-1800	
R70	3.3Meg	½	D-7.101-171	BTS-3.3Meg	
R71	820KΩ	½	D-7.101-136	BTS-820K	
R72	8200Ω	½	D-7.101-55	BTS-8200	
R73	150KΩ	½	D-7.101-107	BTS-150K	
R74	100KΩ	½	D-7.101-99	BTS-100K	
R75	180KΩ	½	D-7.101-111	BTS-180K	
R76	100KΩ	½	D-7.102-108	BTA-100K	
R77	47KΩ	½	D-7.102-94	BTA-47K	
R78	8200Ω	½	D-7.101-55	BTS-8200	
R79	47KΩ	½	D-7.102-94	BTA-47K	
R80	12KΩ	½	D-7.102-89	BTA-12K	
R81	470KΩ	½	D-7.101-129	BTS-470K	
R83	100Ω	½	D-7.101-226	BTS-100	
R83	1Meg	2	D-7.101.143	BTS-1Meg	
R84	8200Ω	2	D-7.103-125	BTS-8200	
R85	150Ω	1	D-7.101-214	BTA-150	
R86	3.3Ω	1	C-6.212.1		
R87	470KΩ	1	D-7.102-137	BTA-470K	
R88	470KΩ	1	D-7.102-137	BTS-470K	
R89	100KΩ	1	D-7.101-100	BTS-100K	
R90	1000Ω	10	B-6.211-6	1 3/4A-1000	
R91	2200Ω	10	B-6.211-7	1 3/4A-2250	
R92	250Ω	7	C-6.215-4	1 3/4A-250	
R93	250Ω	7	C-6.215-4	1 3/4A-250	
R94	3300Ω	1	D-7.102-44	BTA-3300	

* Items R49A, R49B, C33A, C33B, C33C, are combined in one unit.
◆ Items R58A, R58B, R58C, C40A, C40B, C40C are combined in one unit.
Note 1. Not used in all models.

TRANSFORMER (POWER)

ITEM No	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: MAJESTIC PART No.	STANCOR PART No	MERIT PART No	Halldorson PART No	TRIAD PART No	RCA TYPE No.
T1	117VAC	610VCT	5VAC	6.3VAC	9.260		P-3055			
	① 1.52A	.230ADC	③ 3A	④ 1.2						
				SEC 4						
				6.3VAC						
				⑤ 7.2A						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MAJESTIC PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.
T2	Vert. Osc. Trans.	C-9.230-4	A-8125	A-3003	A-97X	209T1⑤	S6702
T3	Horiz. Output Trans.	C-9.253-2	A-8130 ①	HVO-10Z④	U-31 ④	231T1⑤	FB401 ①
T4	Vert. Output Trans.	C-9.234-5	A-8112	A-3036	A-92X ⑤		Z1803
T5A	Yoke -Horiz. (85MH)	C-9.254-3	DY-8A	MDF-72	Y-17	21UD2	DF502
B	Yoke - Vert. (45MH)						
T6	Horiz. Lin. Coil (2-10MH)	B-1.531		WC-5 ②⑦	MWC-6⑦	WC-12 ⑦	21SR1
T7	Width Coil (8-43MH)	B-1.533-1		WC-5 ⑦	MWC-1⑦	WC-11⑦	

① Wire as in original circuit except, connect original terminal #7 to new terminal #2, original #8 to new #5.
② Mount on side of high voltage cage.
③ Connect terminal #6 to terminal #9, then connect original terminal #7 to new terminal #2, original #1 to new #1, original #4 to new #4, original #8 to new #5, original #6 to new #7.
④ See Instruction sheet packed with unit for terminal connections.
⑤ Drill one new mounting hole.
⑥ Enlarge mounting hole.
⑦ Connect to coded orange and black terminals.
⑧ Connect to coded blue and red terminals.
⑨ Use Fig. 3 of instruction booklet packed with unit for terminal connections except, connect original width coil across terminal #8 and #10.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	RATING: IMPEDANCE PRI.	DC RES. SEC.	REPLACEMENT DATA: MAJESTIC PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	NOTES
T8	8.2KΩ	3.7Ω 560 Ω	9.235-4M	A-8114 ①	A-3080	Z1116 ①	S-9Z	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MAJESTIC PART No.	VIKING PART No	QUAM PART No.	NOTES
SP1A	5"	PM	3.7Ω	30.325-2	5J4	5A1	① Used in console models.
B	10"	PM	3.7Ω	30.333 ①	10J1	10A31	
				30.334-2 ①			

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MAJESTIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0ΩCT	0Ω	B-36.141-1				
B	Ant. Coil	0ΩCT	0Ω	B-36.141-3				Channel 3
C	Ant. Coil	0ΩCT	0Ω	B-36.141-4				Channel 4
D	Ant. Coil	0ΩCT	0Ω	B-36.141-5				Channel 5
E	Ant. Coil	0ΩCT	0Ω	B-36.141-6				Channel 6
F	Ant. Coil	0ΩCT	0Ω	B-36.141-7				Channel 7
G	Ant. Coil	0ΩCT	0Ω	B-36.141-8				Channel 8
H	Ant. Coil	0ΩCT	0Ω	B-36.141-9				Channel 9
I	Ant. Coil	0ΩCT	0Ω	B-36.141-10				Channel 10
J	Ant. Coil	0ΩCT	0Ω	B-36.141-11				Channel 11
K	Ant. Coil	0ΩCT	0Ω	B-36.141-12				Channel 12
L	Ant. Coil	0ΩCT	0Ω	B-36.141-13				Channel 13
L2	Fil. Choke	0Ω						
L3A	RF, Mixer grid & Osc. coil	0Ω		B-36.141-102				Channel 2
B	RF Mixer grid & Osc. coil	0Ω		B-36.141-103				Channel 3
C	RF, Mixer grid, & Osc. coil	0Ω		B-36.141-104				Channel 4
D	RF, Mixer grid, & Osc. coil	0Ω		B-36.141-105				Channel 5
E	RF Mixer grid, & Osc. coil	0Ω		B-36.141-106				Channel 6
F	RF Mixer grid, & Osc. coil	0Ω		B-36.141-107				Channel 7
G	RF, Mixer grid, & Osc. coil	0Ω		B-36.141-108				Channel 8
H	RF, Mixer grid, & Osc. coil	0Ω		B-36.141-109				Channel 9
I	RF, Mixer grid, & Osc. coil	0Ω		B-36.141-110				Channel 10
J	RF, Mixer grid & Osc. coil	0Ω		B-36.141-111				Channel 11
K	RF, Mixer grid & Osc. coil	0Ω		B-36.141-112				Channel 12
L	RF, Mixer grid, & Osc. coil	0Ω		B-36.141-113				Channel 13

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MAJESTIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L4	Fil. Choke	0Ω						
L5	1st Video IF	.9Ω						
L6	2nd Video IF	.4Ω	.4Ω	C-1.553	17-1063	TV-116	6249	
L7	3rd Video IF	.4Ω	.4Ω	C-1.553	17-1064	TV-116	6249	
L8	4th Video IF	.4Ω	.4Ω	C-1.553	17-1063	TV-116	6249	
L9	Series Peak. Coil	6.5Ω		C-1.522-4	19-3125		6153	126 Microhenries
L10	Shunt. Peak. Coil	8.5Ω		C-1.522-3	19-3180	TV-184	6180	168 Microhenries
L11	Series Peak. Coil	7Ω		C-1.522-4	19-3125		6153	126 Microhenries
L12	Shunt. Peak. Coil	7Ω		C-1.522-4	19-3125		6153	126 Microhenries
L13	Sound IF	.9Ω		C-1.554	17-3402			Tapped ⓐ .4Ω
L14	Ratio Det.	5.5Ω	1.8ΩCT	C-1.552-1 *	17-3497	TV-115	6205	Tertiary winding=.6Ω
L15	Horiz. Osc.	120Ω		B-1.549	20-1402	TV-162	6183	Primary tapped ⓐ 90Ω Horiz. Waveform winding= 36Ω

* Some models use Ratio Det. (Part # C-1.528-1).

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MAJESTIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 250V			312003. (3AG-3A)	341001	AGC3	HKP
M2	3AGP/T	1/4A 250V			318.250 (3AG P/T-1/4A)		GJV 1/4	

MISCELLANEOUS

ITEM No.	PART NAME	MAJESTIC PART No.	NOTES
M3	Tuner	D-36.137-2	
M4	Switch	B-11.210	Local-distance
M5	Centering magnet	C-336.150A	
M6	Ion trap	C-36.144-2-A	
B3	Trimmer cap	B-4.119-2	Horiz. drive 40-370MMF

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light, check fuse M1, A C interlock assembly, switch on volume control and T1. If filaments light, substitute V18. Check B+ filter and decoupling network components.

SMALL AND/OR DIM PIX

Substitute V18. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M2. Check by substitution V14, V15, V16 and V17. Check waveform W14.

If Satisfac tory	If Unsatisfactory
Check C61, R86, R87, T3, T5A, R84, C57 and other associated circuit components.	Check C56, R83, L15 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V15, V14, V16 and V17. Measure B+.

If Satisfactory	If Unsatisfactory
Proceed as outlined under "Loss of High Voltage".	Proceed as outlined under "Small and/or Dim Pix".

BLOOMING

Check by substitution V14, V15, V16 and V17. Check C61, R86, R87, R84, C57, T3, T5A, picture tube and other associated circuit components.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RAS TER PIX NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5, V6 and V7. Check associated circuit components.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Turer Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector Shaft.

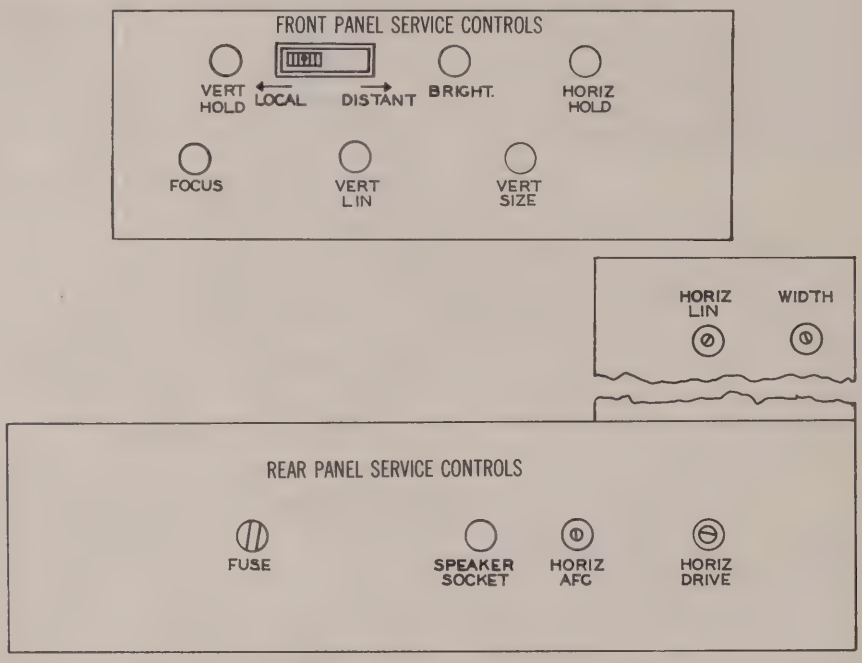
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERIVCE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. Freq., slug L15, until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L14 located ontop of chassis. (See tube placement chart).

FUSES

Two fuses are used. One for Horiz. Sweep Circuit protection and one for L.V. Power Supply protection, (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Turn the disk like knob and at the same time rotate the ring around the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

Remove 4 push on type control knobs from front panel.

Disconnect built-in antenna.

Remove 7 wood and 1 metal screws. Remove rear cover.

Disconnect speaker plug.

Remove 6 chassis bolts. Remove chassis.

Remove 3 speaker nuts. Remove speaker.

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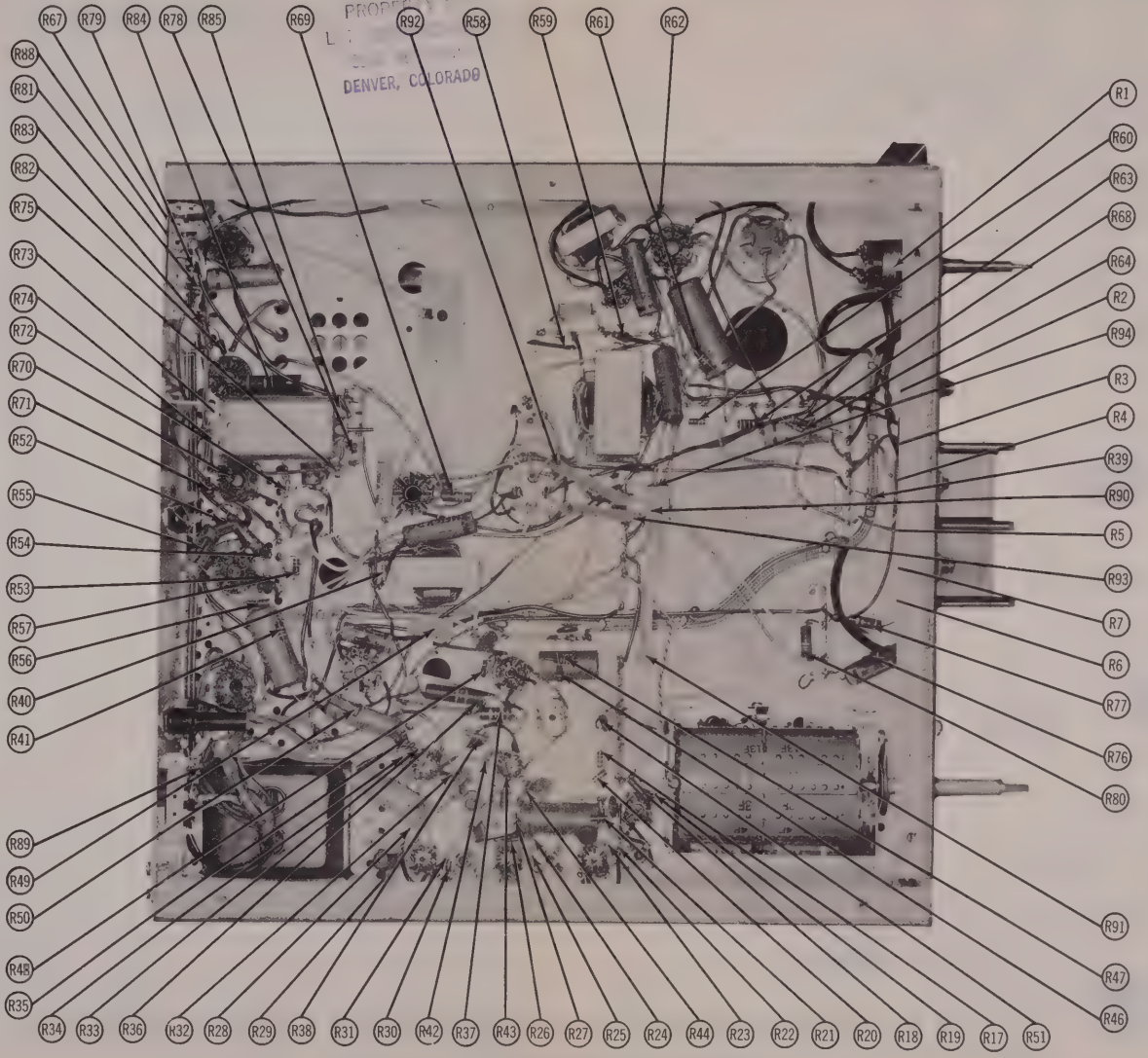
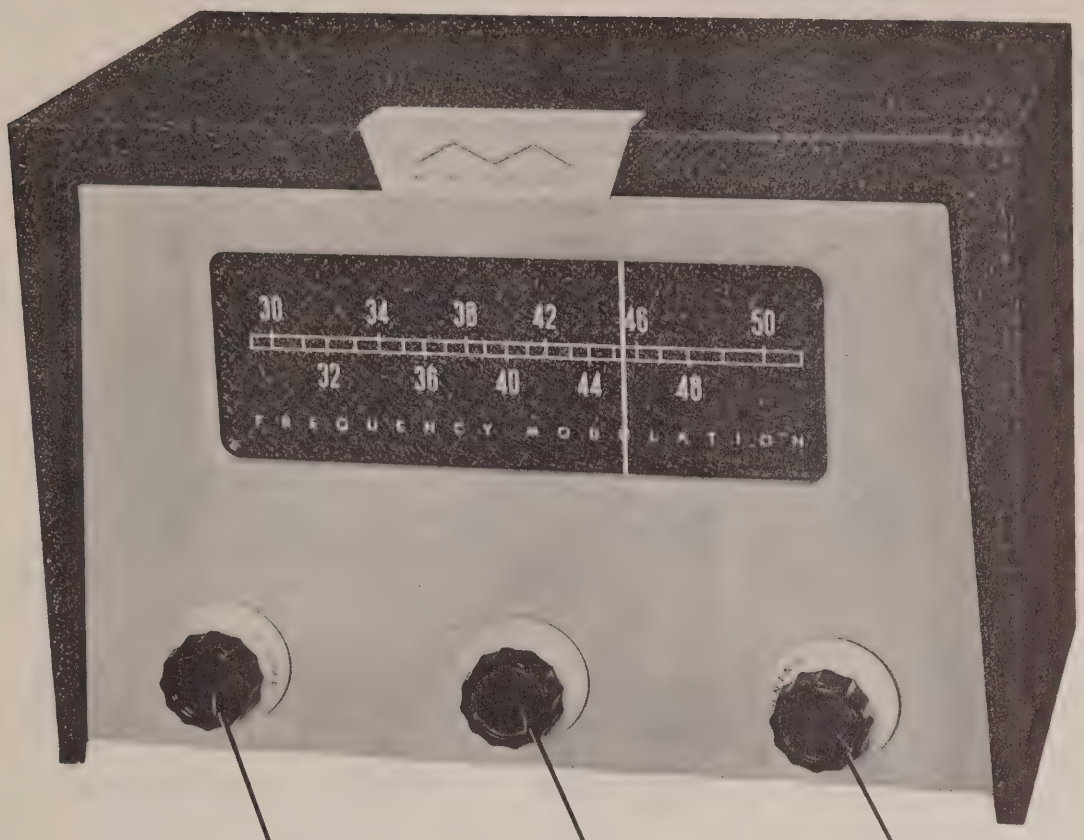


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MONITORADIO
MODEL MR-32



VOLUME CONTROL ON-OFF SWITCH

SQUELCH CONTROL

TUNING CONTROL

MONITORADIO
MODEL MR-32

TRADE NAME	Monitoradio Model MR-32
MANUFACTURER	Radio Apparatus Corp., 55 N. New Jersey, Indianapolis, Ind.
TYPE SET	AC Operated FM Superheterodyne Receiver
TUBES (Eight)	Types 6BJ6 RF Amp., 12AT7 Conv., (2) 6BJ6 IF Amp., 6AL5 Ratio Det., 12AX7 Squelch Control-AF Amp., 6AK6 Audio Output, 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .35 Amp. @ 117 Volts AC
TUNING RANGE	FREQ. MOD. 30-50MC

PROPERTY OF
L. F. CLARKE SHOP
3824 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Monitoradio PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BJ6	6BJ6	7CM	
V2	Converter	12AT7	12AT7	9A	
V3	1st. IF Amp.	6BJ6	6BJ6	7CM	
V4	2nd. IF Amp.	6BJ6	6BJ6	7CM	
V5	Ratio Detector	6AL5	6AL5	6BT	
V6	Squelch Control-AF Amplifier	12AX7	12AX7	9A	
V7	Audio Output	6AK6	6AK6	7BK	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

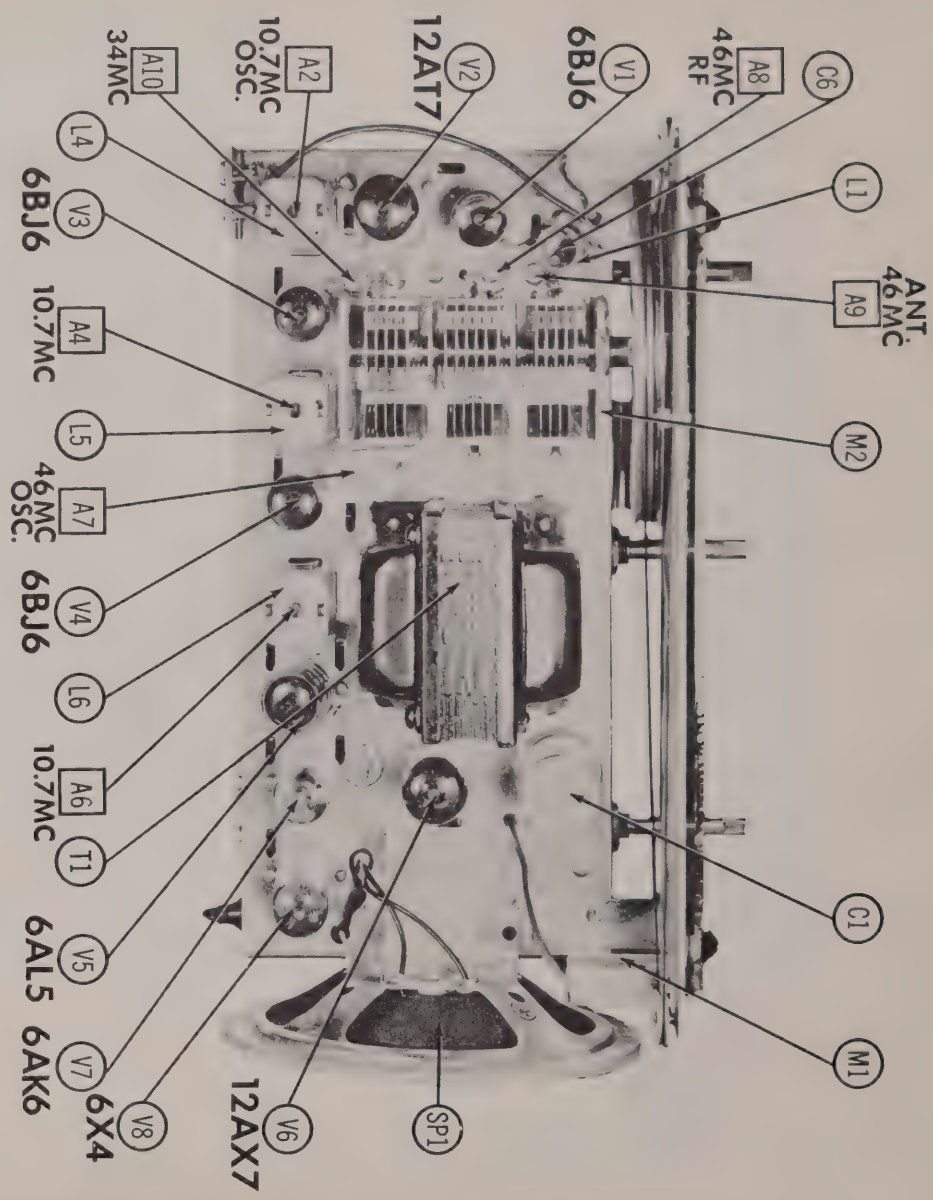
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Monitoradio PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	250	B-300-082-5	AFH3-89		CO67		FP345.8	TVL-3513	
B	▲20	250								
C	20	25								
C2	2	50	B-300-109-1	PRS150/4		BBR2-50T		TC302	TVA-1301	
C3	2	50	B-300-109-1	PRS150/4		BBR2-50T		TC302	TVA-1301	
C4	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C5	15-10		XA1545-003							
C6	6									
C7	1-7.5									
C8	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C9	270			BPD-00027	D6-271		GP2K-271	UC-5327		
C10	27		A-100-203-2							
C11	150			1468-00015		5R5T15		MCB236		
C12	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C13	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C14	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C15	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C16	10000			BPD-01	DD-102	TM5D1	811-01	DC-511	5HK-S1	
C17	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C18	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C19	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C20	100			BPD-0001	D6-101	TM5T1	GP1K-0001	UC-531	5GA-T1	
C21	100			BPD-0001	D6-101	TM5T1	GP1K-0001	UC-531	5GA-T1	
C22	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C23	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C24	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C25	.25	200		P288-25		PJ2P25		PT4025	2TM-P25	
C26	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C27	270			BPD-00027	D6-271		GP2K-271	UC-5327	5GA-T27	
C28	3000			BPD-003	DD-302	TM5D3	812-003	DC-523	5HK-D3	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	Monitoradio PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	300-268-1	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB-	Not Req.	US-26	Attach to R1A
R2A	25KΩ	½	300-268-2	Q14-120	AG-72-V	B-27	U-28	Squelch
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Monitoradio PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R3	1Meg	1/2		BTS-1Meg	
R4	470KΩ	1/2		BTS-470K	
R5	6800Ω	1/2		BTS-6800	
R6	220KΩ	1/2		BTS-220K	
R7	10KΩ	1/2		BTS-10K	
R8	470Ω	1/2		BTS-470	
R9	470Ω	1/2		BTS-470	
R10	82Ω	1/2		BTS-82	
R11	470Ω	1/2		BTS-470	
R12	82Ω	1/2		BTS-82	
R13	470Ω	1/2		BTS-470	
R14	1200Ω	1		BTA-1200	
R15	47KΩ	1/2		BTS-47K	
R16	47KΩ	1/2		BTS-47K	
R17	47KΩ	1/2		BTS-47K	
R18	1500Ω	1		BTA-1500	
R19	330Ω	1/2		BTS-330	
R20	2.2Meg	1/2		BTS-2.2Meg	
R21	220KΩ	1/2		BTS-220K	
R22	15KΩ	1/2		BTS-15K	
R23	47KΩ	1/2		BTS-47K	
R24	220KΩ	1/2		BTS-220K	
R25	33KΩ	1/2		BTS-33L	
R26	470KΩ	1/2		BTS-470K	
R27	560Ω	1/2		BTS-560	
R28	270Ω	1		BTA-270	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Monitoradio PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.
T1	117VAC @ .35A	366VCT .050A	6.3VAC @ 2.7A		500-160 500-160-1 ①				

① Alternate power trans.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA Monitoradio PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	NOTES
T2	8.5KΩ	3.7Ω	304Ω	.34Ω	300-240-1	A-8114	A-2927 ①	Z1116	S-7X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA Monitoradio PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.7Ω	300-071-3	ST-105 Mod P5-X	5A1	

COILS (RF-IF)

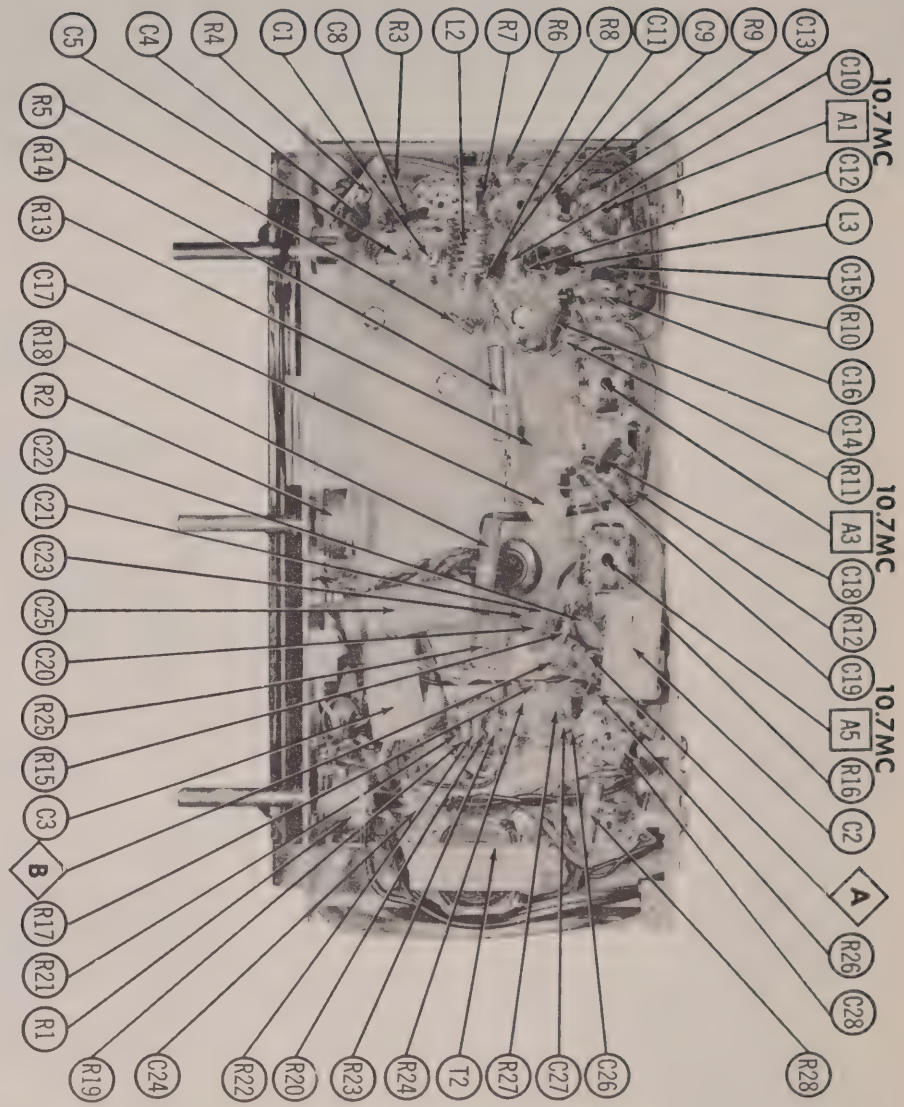
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Monitoradio PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	0Ω (tapped)		500-192				Includes 1.5-10MMF Ant. trimmer, C6 & 5-20MMF Osc. trimmer
L2	RF Coil	0Ω (tapped)		300-276-1				
L3	Osc. Coil	0Ω (tapped)		300-096-3				
L4	Input IF	.7Ω	.7Ω	300-077-2	16-3487	FM-254	1463	
L5	Output IF	.7Ω	.7Ω	300-077-2	16-3487	FM-254	1463	
L6	Ratio Det.	1.6Ω	.9ΩCT	550-001	17-3488 *	FM-255	1465	Tertiary winding -.4Ω

* Cut out chassis hole and drill mounting holes.

MISCELLANEOUS

ITEM No.	PART NAME	Monitoradio PART No.	NOTES
M1	Dial light		# 47 bayonet
M2	Tuning cap	500-150	3 gang (8-46MMF, 9-57MMF, 8-46MMF)
	Cabinet	600-023	
	Knob	500-195-3	Tuning
	Knob	500-195-2	Squelch
	Knob	500-195-1	Volume
	Dial scale	500-168-1	Glass
	Back cover	300-279-1	

CHASSIS—BOTTOM VIEW



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Turn squelch control (R2A) fully clockwise.
Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to terminal 1 on antenna terminal board. Low side to chassis.	10.7MC (Unmod.)	Point on non-interference	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5	Adjust for maximum deflection.
2.	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to terminal 1 on antenna terminal board. Low side to chassis.	10.7MC (450KC Swp)	Point on non-interference	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5	Disconnect stabilizer capacitor C2. Adjust for curve of maximum amplitude and symmetry as in Fig. 1.
2.	"	"	"	"	Vert. Amp. thru 10KΩ to point Ⓑ. Common to chassis.	A6	Reconnect stabilizer capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A5 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	See Fig. 3	Across matching pad (Fig. 3)	46MC (Unmod)	46MC	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9	Attenuate generator to maintain not more than 5 volts at VTVM. Adjust in order given for maximum deflection.
4.	"	"	34MC	34MC	"	A10	Attenuate generator to maintain not more than 5 volts at VTVM. Adjust in order given for maximum deflection. Repeat steps 3 and 4.
5.	"	"	"	"	"		Adjust for maximum deflection by compressing or expanding turns of L1 and L2.
6.	Repeat steps 3, 4 and 5 until dial calibration at 34 and 46MC is accurate within the width of the pointer. Repeat adjustments until no improvement in output can be obtained by inserting either end of tuning wand into L1 or L2.						

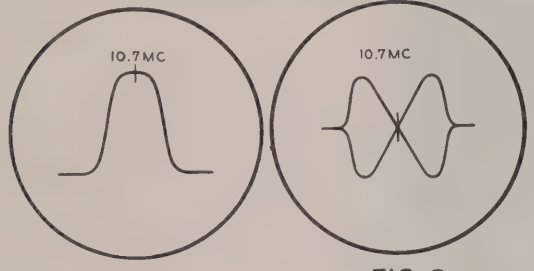


FIG. 1

FIG. 2

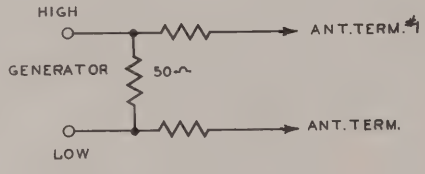
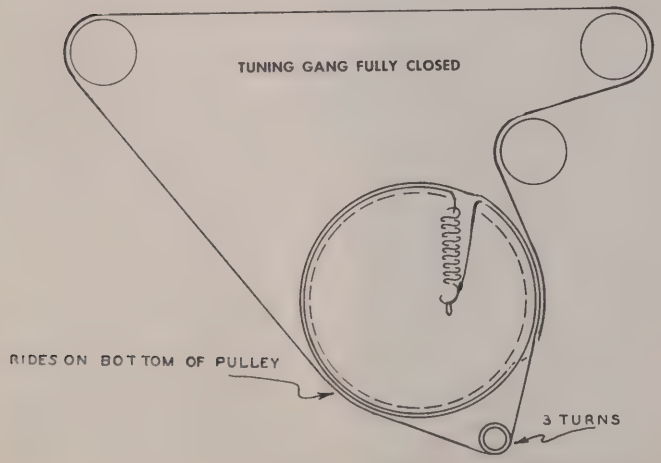
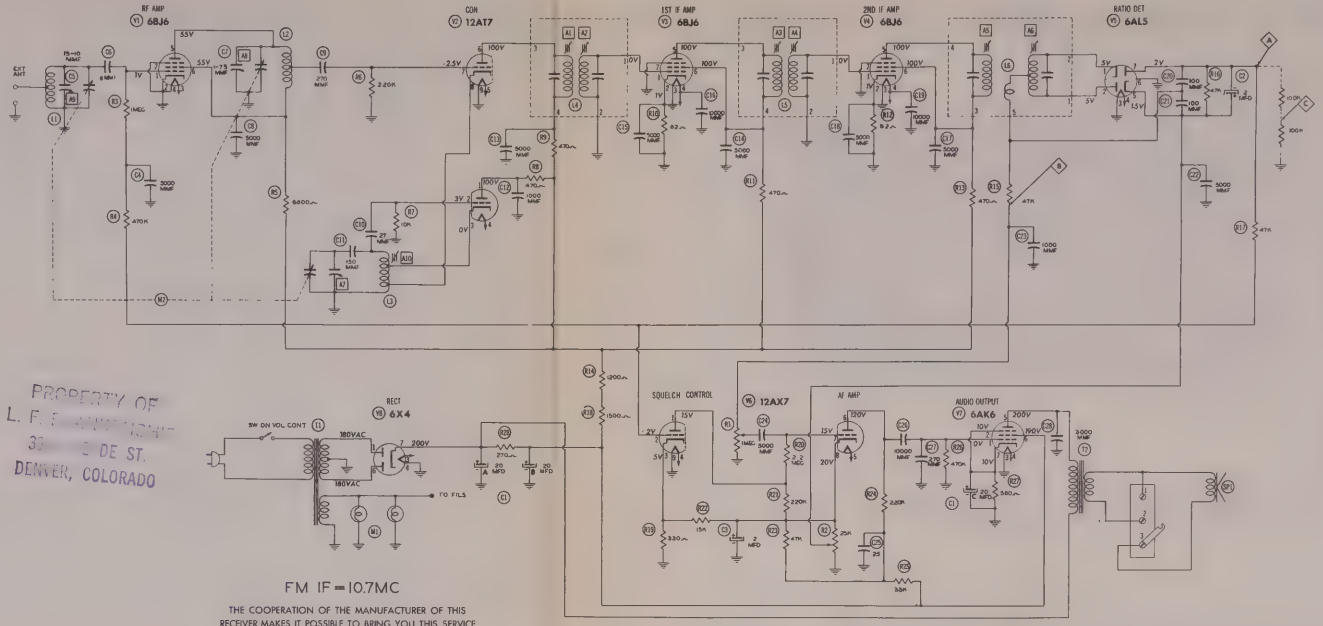


FIG. 3



DIAL CORD STRINGING



FM IF = 10.7MC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BJ6	1.6Meg	0Ω	.1Ω	0Ω	† 9.8KΩ	† 9.8KΩ	0Ω		
V 2	12AT7	† 3.4KΩ	10KΩ	0Ω	.1Ω	.1Ω	† 3.4KΩ	220KΩ	0Ω	0Ω
V 3	6BJ6	.7Ω	82Ω	0Ω	.1Ω	† 3.4KΩ	† 3.4KΩ	0Ω		
V 4	6BJ6	.7Ω	82Ω	0Ω	.1Ω	† 3.4KΩ	† 3.4KΩ	0Ω		
V 5	6AL5	1.1Meg	1.1Meg	0Ω	.1Ω	25KΩ	0Ω	72KΩ		
V 6	12AX7	† 300KΩ	120KΩ	330Ω	.1Ω	.1Ω	† 250KΩ	2.4Meg	25KΩ	0Ω
V 7	6AK6	470KΩ	560Ω	0Ω	.1Ω	† 300Ω	† 270Ω	560Ω		
V 8	6X4	90Ω	INF	.1Ω	0Ω	INF	95Ω	100KΩ		

† MEASURED FROM PIN 7 OF V8.

1. DC voltage measurements taken with vacuum tube voltmeter, AC volts, as measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

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MOTOROLA MODELS Y24K1, B, Y24K2, B, Y24K3, W, Y27K2, B, Y27K3 (Ch. TS602Y), 24K1, B, 24K2, B, 24K3, W, 27K2, B, 27K3 (Ch. TS602)

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MODEL Y24K3W

MOTOROLA MODELS Y24K1, B, Y24K2, B, Y24K3, W, Y27K2, B, Y27K3 (Ch. TS602Y), 24K1, B, 24K2, B, 24K3, W, 27K2, B, 27K3 (Ch. TS602)

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MOTOROLA MODELS Y24K1, B, Y24K2, B, Y24K3, W, Y27K2, B, Y27K3 (Ch. TS602Y), 24K1, B, 24K2, B, 24K3, W, 27K2, B, 27K3 (Ch. TS602)

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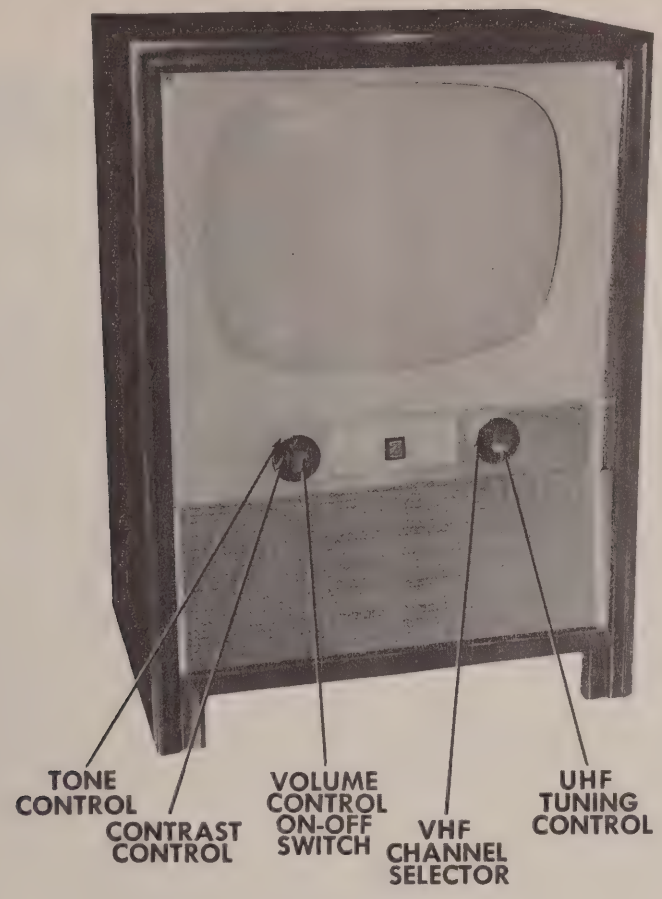

MODEL Y24K3W

TRADE NAME	Motorola	MODELS	CHASSIS	TUNER	
				VHF	UHF
		Y24K1, Y24K1B Y24K2, Y24K2B Y24K3, Y24K3W Y27K2, Y27K2B Y27K3	TS-602Y	VTT-42Y	TT37
		24K1, 24K1B 24K2, 24K2B 24K3, 24K3W 27K2, 27K2B 27K3	TS-602	VTT-42	
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Ill.				
TYPE SET	Television Receiver				
TUBES	Twenty-one				
POWER SUPPLY	110-120 Volts AC-60 Cycle		RATING 2 Amp. @ 117 Volts AC		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF,		Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

INDEX

Alignment Instructions 6, 7, 8
Disassembly Instructions 21
Horizontal Sweep Circuit Adjustments 18
Parts List and Discriptions ..... 13 thru 16
Photographs
- Cabinet-Rear View 18
- Capacitor Identification 4, 9
- Chassis - Top View 3
- RF Tuner 5, 18
- Resistor Identification 19, 20
- Trans., Inductor and Alignment Identification 17

Resistance Measurements 11
Servicing in the Field 21
Schematic 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 10
Tube Placement Chart (Bottom View) 11
Tube Placement Chart (Top View) 10

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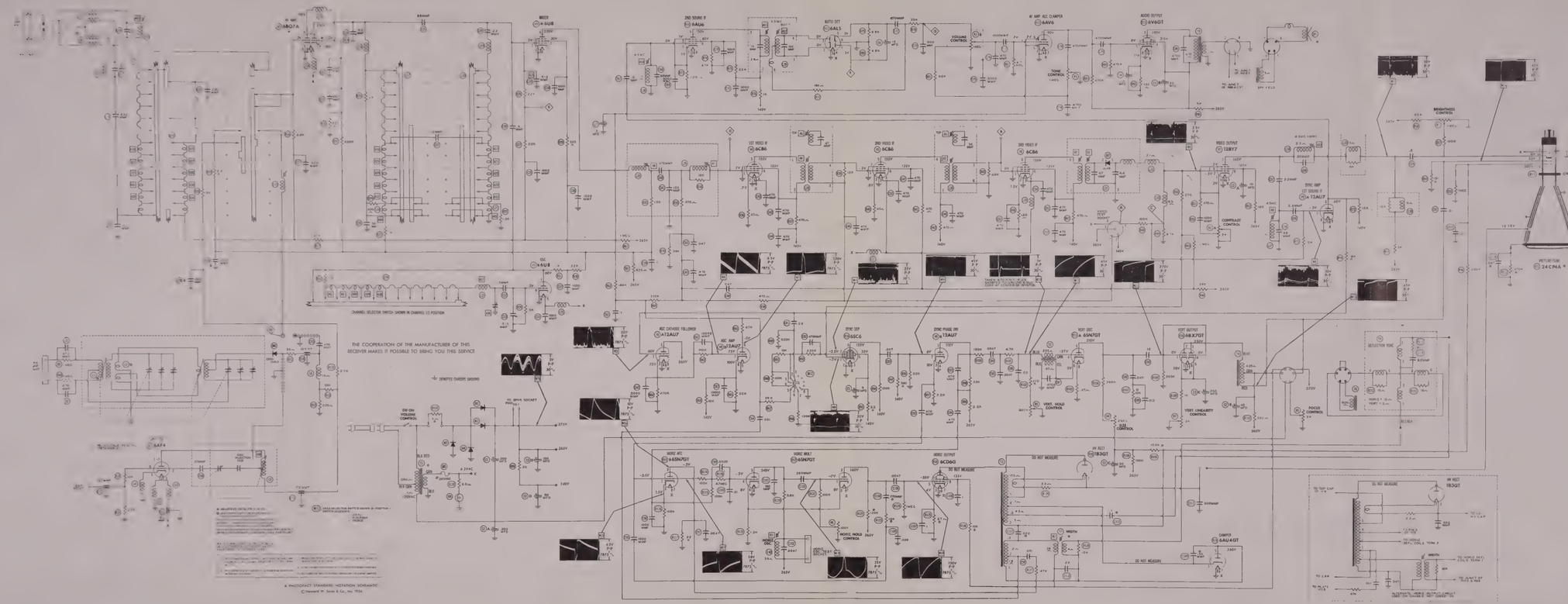
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DO NOT MEASURE
PICTURE TUBE
24CP4A

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MOTOROLA MODELS Y24K1, B, Y24K2, B, Y24K3, W, Y27K2, B, Y27K3 (Ch. T5602Y), 24K1, B, 24K2, B, 24K3, W, 27K2, B, 27K3 (Ch. T5602)

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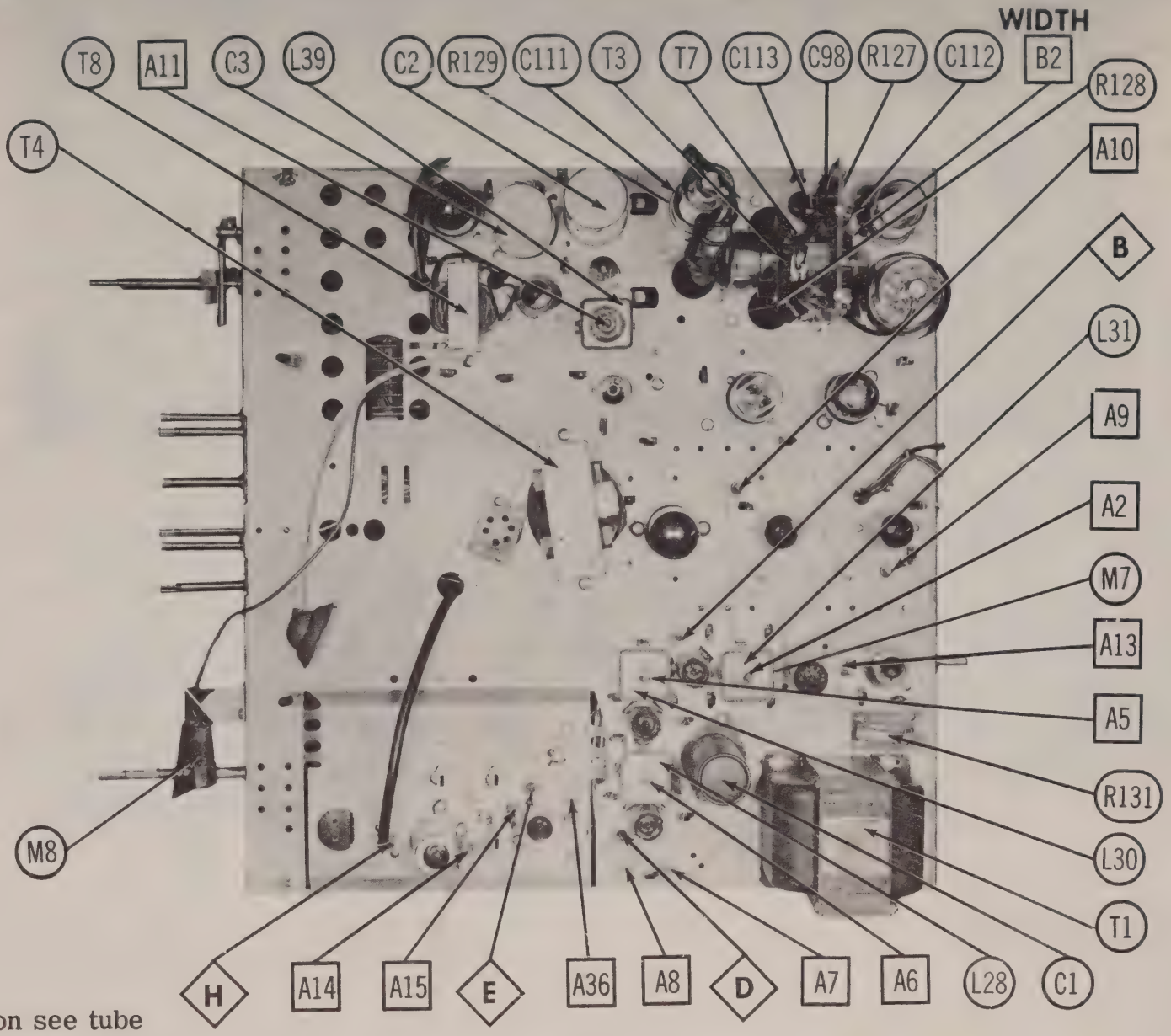
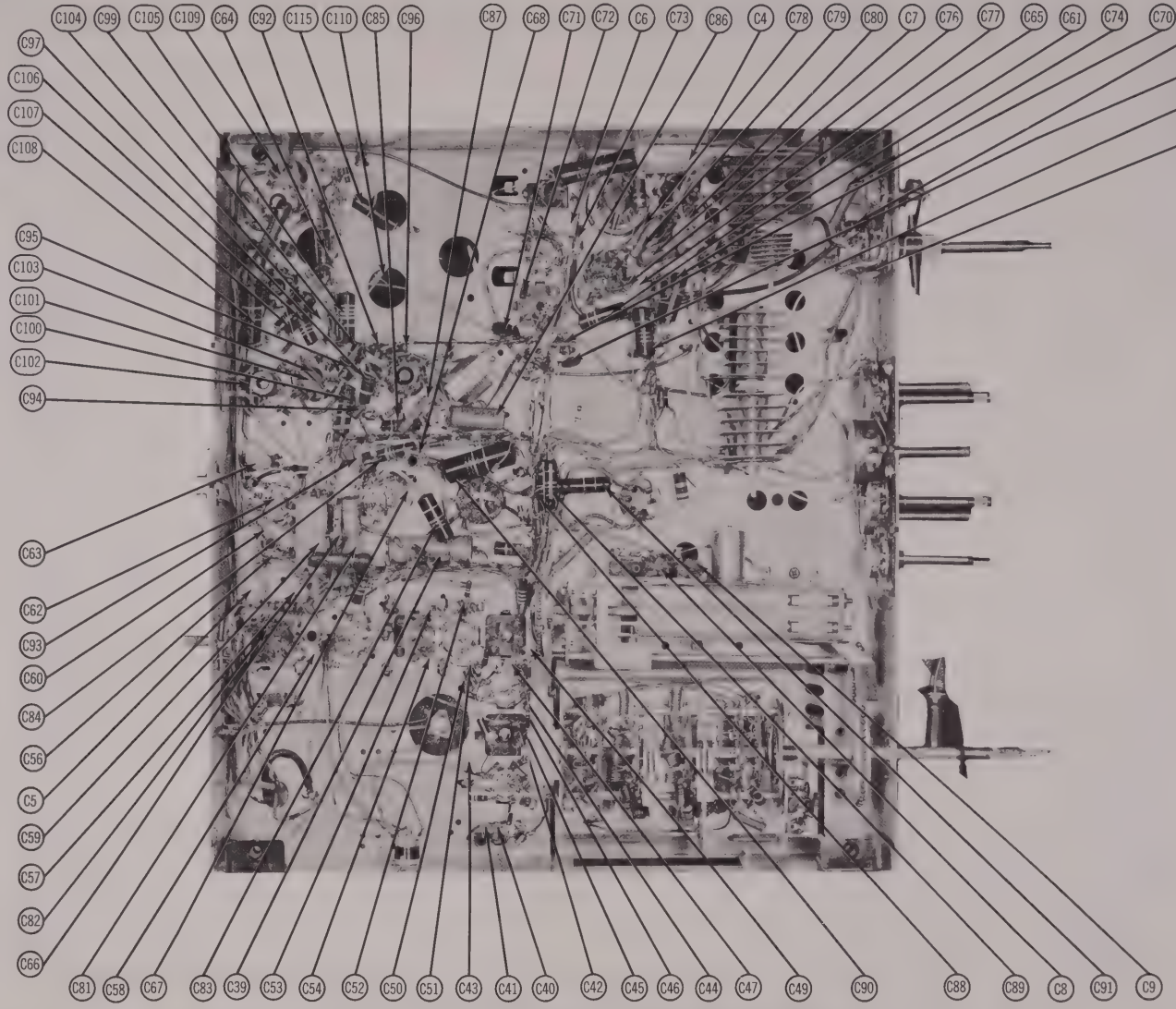


For tube location see tube placement chart page 10.

CHASSIS TOP VIEW

MOTOROLA MODELS Y24K1, B, Y24K2, B, Y24K3, W, Y27K2, B, Y27K3 (Ch. T5602Y), 24K1, B, 24K2, B, 24K3, W, 27K2, B, 27K3 (Ch. T5602)



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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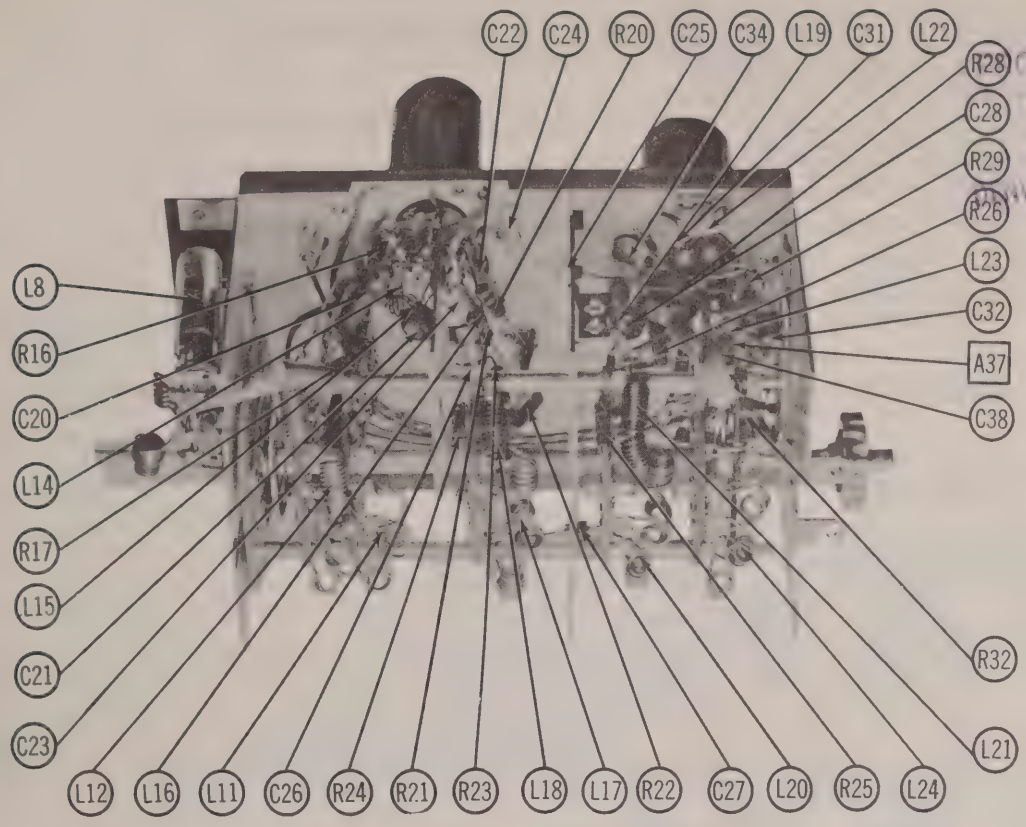
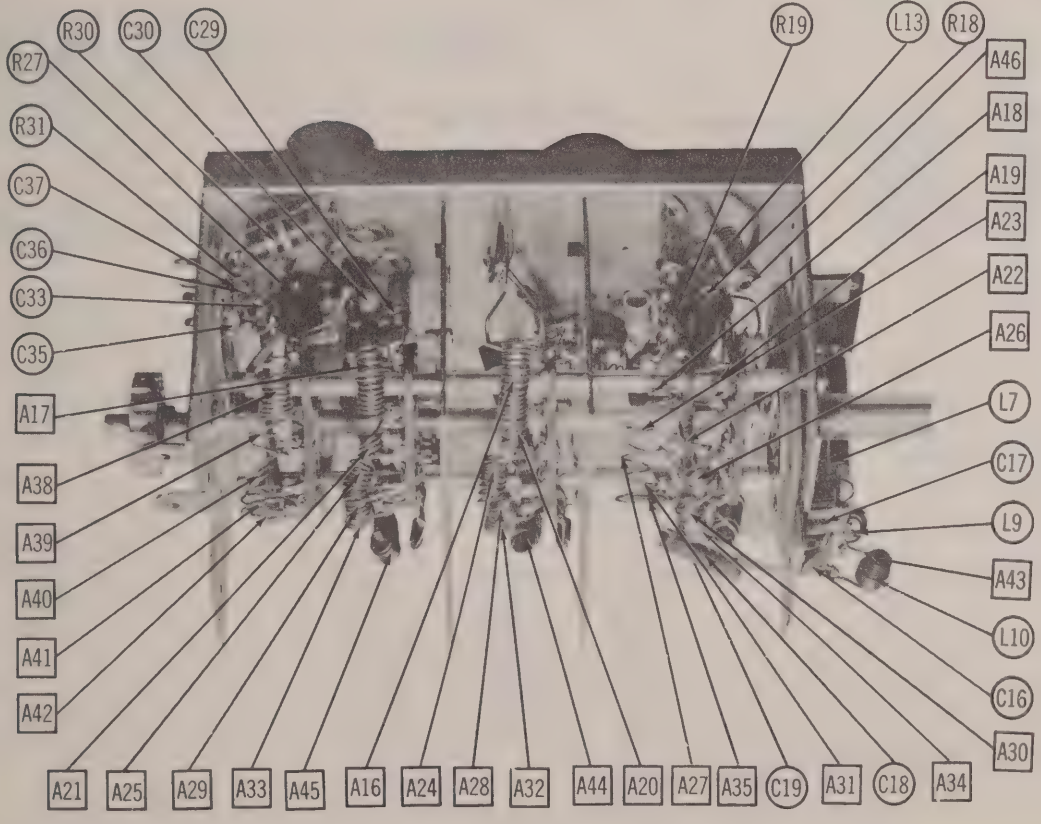


VHF TUNER-RIGHT SIDE



VHF TUNER-LEFT SIDE

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal output tube (V18).
The possibility of RF interference from V14 during alignment is also eliminated by this procedure.
Connect a 2500Ω 25 watt resistor from C3D to chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative side of a 3 volt battery to pin 1 of the test receptacle on the IF strip. Connect the positive lead to chassis.
Turn area selector switch to LOCAL position.
If a distorted or unstable response curve is seen on the scope during alignment it may be necessary to detune the local oscillator by connecting a 470MMF capacitor from the channel 13 oscillator inductance to chassis.
Two peaks will be found when setting the cores of the IF coils and traps. The correct peaks will occur when the cores are at the outer end of the winding.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to point (B). Low side to chassis.	44MC (10MC Swp)	42.25MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A1, A2	Connect the DC probe of VTVM to point (C). Common to chassis. Adjust sweep generator output for 3 volts DC at VTVM. Adjust A1 and A2 for response similar to Fig. 1.
2.	"	High side to point (D). Low side to chassis.	"	42.25MC 45.75MC	"	"	A3, A4	Adjust to place markers 30% down on the response curve as in Fig. 2.
3.	"	"	"	41.25MC 47.25MC	"	"	A5, A6	Adjust for MINIMUM marker amplitude. See Fig. 2.
4.	"	High side to point (E). Low side to chassis.	"	42.25MC 45.75MC	"	"	A7, A8	Adjust for response similar to Fig. 3. A8 affects the high side of the curve while A7 affects tilt.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set contrast control at maximum contrast position.
If a 4.5MC signal of crystal accuracy is not available a TV station signal may be used.
VTVM connections and adjustment of A9 thru A12 should be made as in steps 5 and 6.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.005MFD	High side to point (C). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (F). Common to chassis.	A9, A10, A11	Adjust for maximum deflection with VTVM set to 5 volt scale. Attenuate generator as necessary.
6.	"	"	"	"	DC probe to point (G). Common to chassis.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.
Set contrast control at maximum contrast position.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.005MFD	High side to point (C). Low side to chassis.	4.5KC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. to point (F). Low side to chassis.	A9, A10 A11	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as in Fig. 4.
6.	"	"	"	"	"	Vert. Amp. to point (G). Low side to chassis.	A12	Reconnect stabilizer capacitor C6. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 5. SLIGHTLY re-touch A11 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Set contrast control at maximum contrast position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.005MFD	High side to point (C). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector (Fig. 6) to pin 11 of picture tube. Common to chassis.	A13	Adjust for MINIMUM deflection. Remove 470MMF capacitor from channel 13 oscillator inductance to chassis.

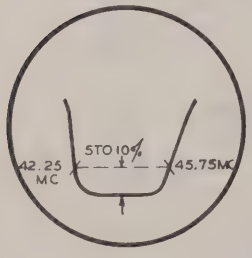


FIG.1

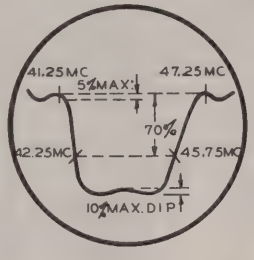


FIG.2

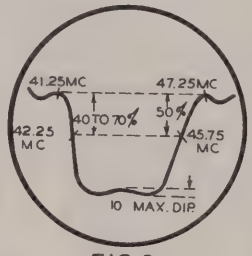


FIG.3

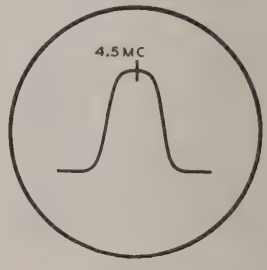


FIG.4

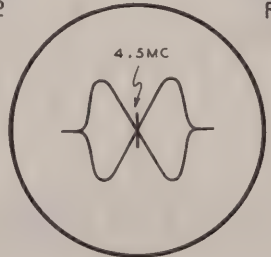


FIG.5

ALIGNMENT INSTRUCTIONS (cont)

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ANTENNA AND RF ALIGNMENT

Set fine tuning control to minimum capacity.
Ground tuner AGC terminal to chassis.
Remove antenna lead in and plug from antenna receptacle.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Couple to antenna receptacle with 120Ω in each lead. (Use very short leads)	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. thru 27KΩ to point (E). Low side to chassis.	A14, A15	Attenuate sweep generator to maintain not more than .05 volts peak to peak on scope. Adjust scope gain as necessary for usable pattern. Adjust for response similar to Fig. 7. A14 positions curve and A15 affects tilt.
9.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Adjust coils L16 and L19 (by compressing or expanding coil) for response similar to Fig. 7. L16 positions curve and L19 affects tilt. Recheck channel 8. If necessary retouch A14 and A15.
10.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		With tuner shield in place check for response similar to Fig. 7 for channels 7 to 13. If necessary repeat steps 8 and 9.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
11.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A16, A17	Adjust by compressing or expanding coil turns. A17 positions curve and A16 affects tilt. Adjust for response similar to Fig. 8. If "absorption notch" occurs it may be necessary to perform step 13 first, then return to step 11.
12.	Two 120Ω carbon resistors	Couple to antenna receptacle with 120Ω in each lead. (Use very short leads).	85MC (10MC Swp)	83.25MC 87.75MC	6	Vert. amp. thru 27KΩ to point (E). Low side to chassis.	A18, A19	Adjust A18 and A19 (by compressing or expanding coil) to remove tilt. If necessary, alternately adjust A16, A17, A18 and A19 to obtain response similar to Fig. 8 with greatest gain, least tilt, and symmetrical skits.
13.	"	"	"	"	"	"		Adjust FM trap L9 (by compressing or expanding coil turns) until all affects of "absorption notch" on response curve skirts is removed.
14.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A20, A21 A22, A23	Adjust (compress or expand, coil turns) for maximum gain and symmetry of response similar to Fig. 8.
15.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A24, A25 A26, A27	"
16.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A28, A29 A30, A31	"
17.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A32, A33 A34, A35	"

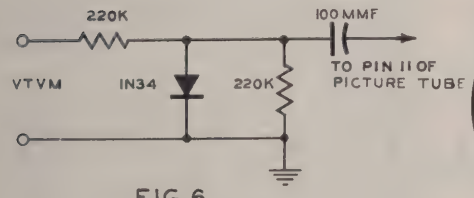


FIG.6

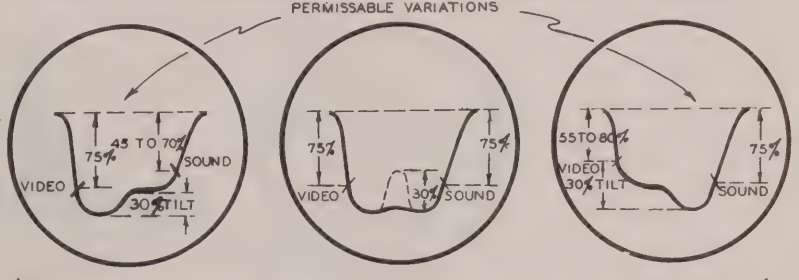


FIG.7

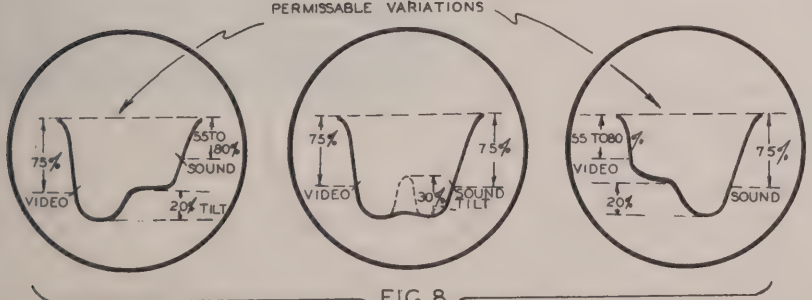
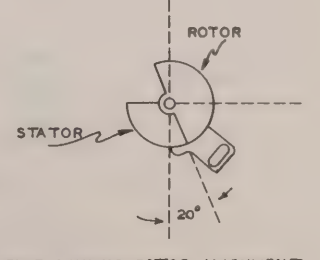


FIG.8



FINE TUNING ROTOR ALIGNMENT POSITION

FIG.9

MOTOROLA MODELS Y24K1, B, Y24K2, B, Y24K3, W, Y27K2, B, Y27K3 (Ch. TS602Y), 24K1, B, 24K2, B, 24K3, W, 27K2, B, 27K3 (Ch. TS602)

ALIGNMENT INSTRUCTIONS -(cont)

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.
See fig. 9 for proper position of fine tuning rotor.
Remove short from tuner AGC terminal to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω Carbon Resistors	Couple to antenna receptacle with 120Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A36	Attenuate sweep output to avoid limiting. Adjust so that sound marker falls in trap notch as in Fig. 10. Video marker should be at 50%.
19.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A37	Adjust (compress or expand coil) to place sound marker in trap notch as in Fig. 10. Video marker should be at 50%. If A37 required adjustment recheck channel 8.
20.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for response similar to Fig. 10. If some channels mistrack make compromise adjustments of A36 and A37 for those channels, then recheck channels 13 thru 8 to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
21.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A38	Adjust (compress or expand coil) so that sound marker falls in trap notch as in Fig. 10. Video marker should be at 50%.
22.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A39	"
23.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A40	"
24.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A41	"
25.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A42	Adjust (compress or expand coil) so that sound marker falls in trap notch as in Fig. 10. Video marker should be at 50%. Replace tuner shield and recheck tracking on all channels. If necessary repeat steps 18 thru 25.
26.	"	"	44MC (10MC Swp)	44MC	2	"	A43	Adjust the IF trap coil slug A43 for MINIMUM response at 44MC as in Fig. 11.

UHF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
27.	Fig. 12.	Thru matching network (Fig. 13) to point (H).	44MC (20MC Scp)	41.25MC 45.75MC	UHF	Vert. amp. thru 27KΩ to point (E). Low side to chassis.	A44, A45	Adjust (compress or expand coil) for response similar to Fig. 13.
28.	"	"	"	"	"	"	A46	Adjust to remove tilt in response curve. Replace VHF tuner shield. Move vert. amp. of scope to point (A). Check for overall response curve similar to Fig. 3.

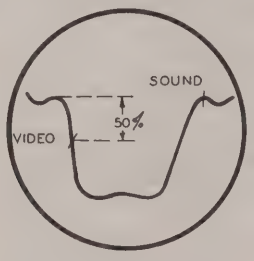


FIG.10

FIG.11

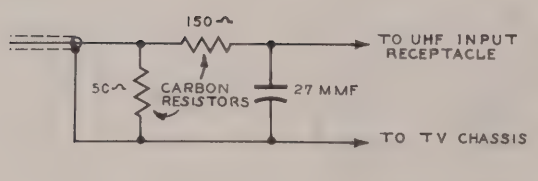
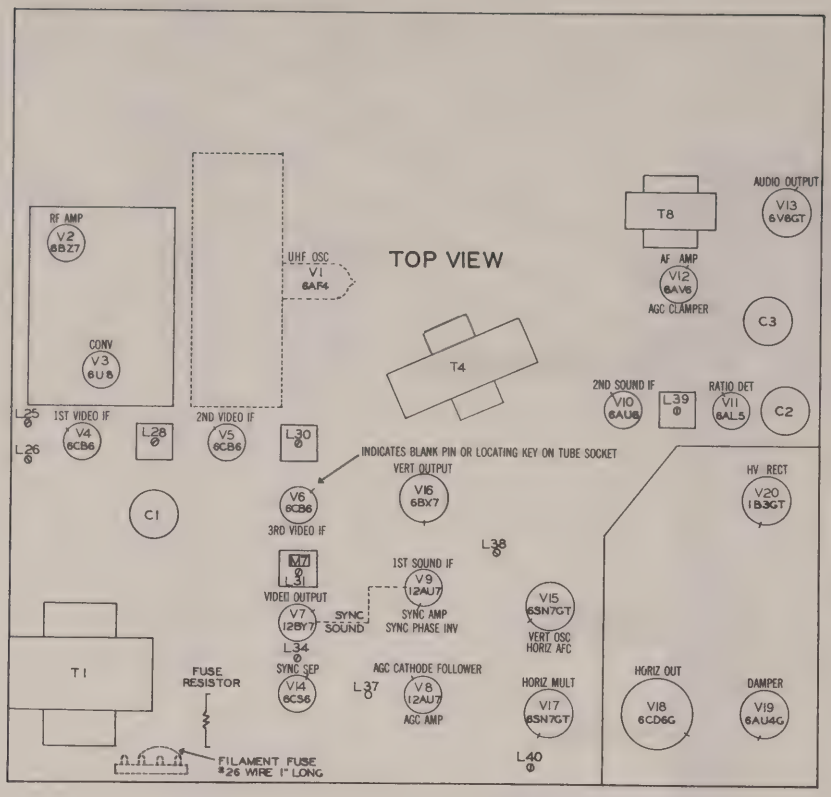


FIG. 12

FIG. 13

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Sel. Rect. (M1, M2, M3, M4), Fuse Wire (M5)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7, (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V21**
Has pic, no sound - **V9, V10, V11, V12, V13**
Overloaded picture - **V8, V12**

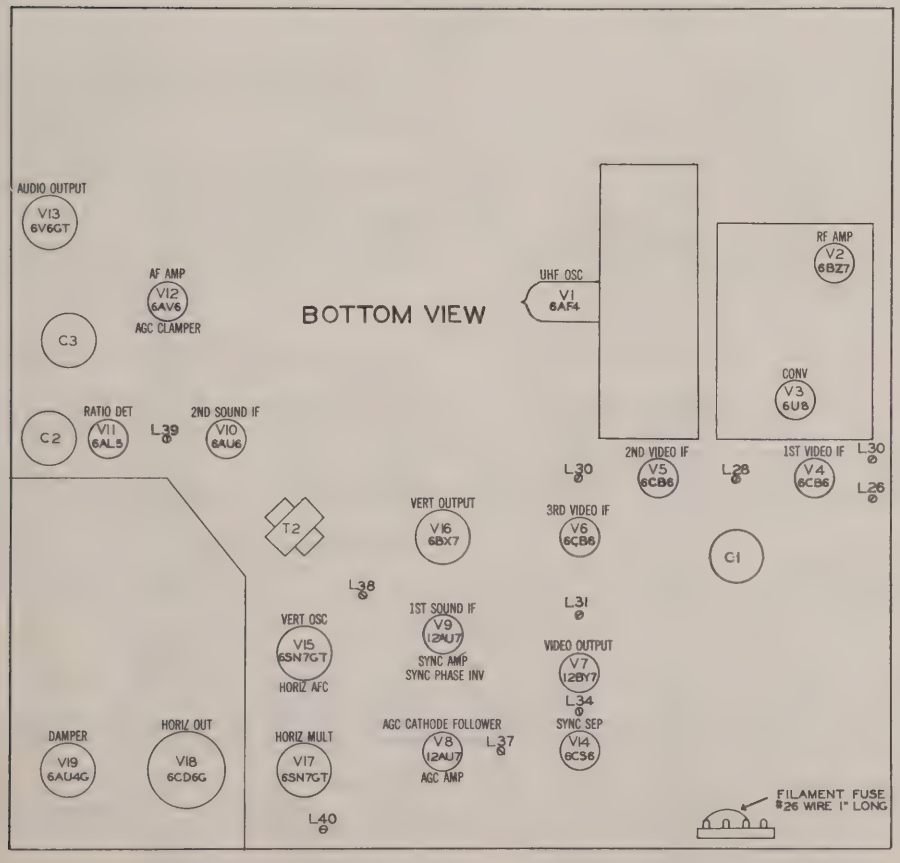
SYNC FAILURE
No vert. sync - **V9, V15**
No horiz. sync - **V9, V15, V16**
No vert. or horiz. sync - **V9, V14**

SWEEP FAILURE
No raster, has sound - **V17, V18, V19, V20, V21**
No vertical deflection - **V15, V16**
Poor vert. linearity or foldover - **V15, V16**
Poor horiz. linearity or foldover - **V17, V18, V19**
Narrow picture - **V17, V18, V19, V20, M1, M2, M3, M4**
Vert. off freq. - **V9, V15**
Horiz. off freq. - **V9, V15, V16**

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■7.5KΩ	21KΩ	.1Ω	0Ω	0Ω	21KΩ	†■7.5KΩ		
V 2	6BQ7A	†2KΩ	†440KΩ	INF	0Ω	.1Ω	INF	420KΩ	0Ω	0Ω
V 3	6U8	†24KΩ	420KΩ	†560KΩ	0Ω	.1Ω	†16KΩ	0Ω	0Ω	15KΩ
V 4	6CB6	39KΩ	47Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 5	6CB6	39KΩ	47Ω	0Ω	.1Ω	†2.5KΩ	†40KΩ	0Ω		
V 6	6CB6	1Ω	120Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 7	12BY7	75Ω	4.7KΩ	75Ω	.1Ω	.1Ω	0Ω	†5.5KΩ	†18KΩ	75Ω
V 8	12AU7	†50Ω	†20KΩ	470KΩ	0Ω	0Ω	350KΩ	570KΩ	22KΩ	.1Ω
V 9	12AU7	†35KΩ	22KΩ	2.2KΩ	0Ω	0Ω	†17KΩ	15KΩ	0Ω	.1Ω
V 10	6AU6	1Ω	220Ω	0Ω	.1Ω	†3KΩ	†20KΩ	220Ω		
V 11	6AL5	INF	INF	0Ω	.1Ω	6.8KΩ	0Ω	6.8KΩ		
V 12	6AV6	4.7Meg	0Ω	.1Ω	0Ω	380KΩ	380KΩ	†470KΩ		
V 13	6V6GT	1Ω	.1Ω	†2.5KΩ	†1.5KΩ	470KΩ	50KΩ	0Ω	330Ω	
V 14	6CS6	32KΩ	0Ω	.1Ω	0Ω	†100KΩ	†24KΩ	1Meg		
V 15	6SN7GT	300KΩ	22KΩ	100KΩ	400KΩ	▲1.3Meg	50Ω	.2Ω	0Ω	
V 16	6BX7GT	560KΩ	†750Ω	1.7KΩ	560KΩ	†750Ω	1.7KΩ	0Ω	.1Ω	
V 17	6SN7GT	160KΩ	†120KΩ	1.2KΩ	5Meg	†5.6KΩ	1.2KΩ	.1Ω	0Ω	
V 18	6CD6G	350KΩ	0Ω	27Ω	300KΩ	1Meg	60KΩ	.1Ω	†10KΩ	TOP CAP ▲7Ω
V 19	6AU4GT	INF	INF	200KΩ	INF	†90Ω	†50Ω	.1Ω	0Ω	
V 20	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ▲162Ω
V 21	24CP4A	.1Ω	150KΩ	Pin 10 ▲220KΩ	Pin 11 †300KΩ	Pin 12 0Ω				

■ MEASURED WITH CHANNEL SELECTOR IN UHF POSITION
† MEASURED FROM OUTPUT OF M1-M2
▲ MEASURED FROM PIN 3 OF V19



TUBE PLACEMENT CHART

SET 233 FOLDER 6

PROPERTY OF
DENVER, COLORADO

TROUBLE SHOOTING AIDS

CAUTION

A line isolation transformer should be used to remove shock hazzard and prevent damage to receiver and/or test equipment. A transformer with a minimum rating of 220 watts should be used.

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18 and V19. Check adjustment B2. Check waveform W19.

If Satisfactory	If Unsatisfactory
Check C108, C110, C112, C113, T3, T5A, R126, R128 and other associated circuit components.	Check C101, C103, C106, R119, R122, R124 and other associated circuit components.

DRIVE LINES

Check by substitution V17, V18 and V19. Check C104, C105, C108, C109, C110, C112, C113, T3, T5A, R126, R124 and other associated circuit components.

COMPRESSED LEFT SIDE

Check by substitution V17, V18 and V19. Check horizontal output and damper circuit components especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

XMAS TREE EFFECT

Substitute V17. Check C101, C102, C103, L40 and other associated circuit components.

PIE CRUST EFFECT

Check by substitution V17, V18 and V19. Check C100 for open. Check T3 and associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R110 and other associated circuit components.	Check C88, C90, R104, R106, R108, T2 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check C3C, T4, T5B and other associated components.

COMPRESSED AT TOP

Check by substitution V15 and V16. Check C88, C89, C90, R104, R108 and other associated circuit components for failure or change of value.

FOLDS

Substitute V15 and V16. Check components associated with V15A and V16 for failure or change of value.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Check by substitution V8, V9 and V14. Check components associated with these stages for failure or change of value.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V14 and V9. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check components associated with V15A.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V15 and V17. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check components associated with V15B and V17.	Check C94, R115, R114 and other associated components.

HORIZONTAL BENDING

Check by substitution V15, V17 and V18. Check horizontal AFC filter network (C99, C100 and R118) for failure or change of value.

VIDEO

LOSS OF VIDEO

Substitute V7. Check C59, picture tube and other associated circuit components.

SOUND BARS (4.5 MC BEAT)

Check adjustment of the tuner fine tuning. Check 4.5 MC trap adjustment (A13). Check video IF alignment.

POOR CONTRAST

Check by substitution V7. Check video detector crystal and assembly. Check picture tube and other associated circuit components.

NEGATIVE PIX

Check by substitution V7 and V8. Check video detector assembly. Check AGC network, picture tube and other associated components.

SMEAR

Substitute V7. Check video detector assembly. Check L35, L36, R53, R52, C59, picture tube and other associated components for failure or change of value.

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11, V12 and V13. Check stages of V12 and V13 using audio signal generator. Apply signal across R82.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and circuit components.	Check components associated with V12 and V13.

BUZZ

Adjust tuner fine tuning for best picture and sound. Check adjustment of A12 for minimum buzz. If buzz is still objectionable substitute V11 and realign the audio IF and ratio detector stages.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6U8	6U8	9AE	
V4	1st Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	12BY7	12BY7	9BF	
V8	AGC Cathode Follower-AGC Amplifier	12AU7	12AU7	9A	
V9	1st Sound IF Amp. Sync Amplifier Sync Phase Inv.	12AU7	12AU7	9A	
V10	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AF Amplifier AGC Clamper	6AV6	6AV6	7BT	
V13	Audio Output	6V6GT	6V6GT	7S	
V14	Sync Separator	6CS6	6CS6	7CH	
V15	Vert. Oscillator Horiz. AFC	6SN7GT	6SN7GT	8BD	
V16	Vert. Output	6BX7	6BX7	8BD	
V17	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6AU4GT	6AU4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	

PROPERTY OF
DENVER, COLORADO

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				RETMA BASE TYPE	NOTES
	MOTOROLA PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.		
V21A	24C/VP4	24CP4		24CP4	12D	
		24CP4A	24CP4A	24CP4A	12D	
B	24AP4	24AP4	24AP4		12D	
C	24QP4					
D	27EP4A	27EP4A	27EP4A		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	200	150	23B722771	E3A294		XA004		FP117 TC49		
C2A	200	150	23B721875	E4D608					TVL-4640	
B	▲40	300								
C	■30	400								
D	▲50	250								
C3A	▲10	250	23B721874	E4D609					TVL-4608	
B	■20	350								
C	250	50								
D	▲150	300								
C4	10	50	23A90205	PRS50/10		BR105		TC32	TVA-1304	
C5	5	150	23K710761	PRS150/4		BR415		TC40	TVA-1402	
C6	10	50	23A90205	PRS50/10		BR105		TC32	TVA-1304	
C7	3	50	23A690543	PRS150/4		BR550		TC30	TVA-1303	
C8	470		21R115856	SI470	D 6-471		GP2K-471	UC-5347	5GA-T47	
C9	470		21R115856	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C10	27		21A731037							
C11	100		21R120806							
C12	100		21R120806							
C13	100		21R120806							
C14	10		21R120805							
C15	470		21R114554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C16	33		21R119912							
C17	27		21R119896							
C18	220		21R115905	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C19	5		21R115955							
C20	220		21R115905	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C21	1000		21R115386	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C22	1000		21R115386	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	1000		21R115386	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C24	.5-3		21K710943		829-3			CT565A		
C25	.68		2R115965							
C26	56		21R120204							
C27	1.2		21R115958							
C28	22		21R120203							
C29	.5-3		21K710943		829-3			CT565A		
C30	.5									
C31	1000		21R115386	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C32	10		21R400050							
C33	.5-3		21K710943		829-3			CT565A		
C34	1000		21R115386	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	1000		21R115386	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C36	1000		21R115386	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C37	1000		21R115386	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C38A	1000		21R400937	BPD-2X001	DD2-102	TM5DD1	822-001	DCD-521	5HK-2D1	
B	1000									
C39	.1	600	8K490263	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C40	470		21R114554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C41	150			SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C42	470		21R114554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C43	470		21R114554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C44	470		21R114554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C45	470		21R114554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C46	470		21R114554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C47	470		21R114554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	

(CONT'D ON NEXT PAGE)

PROPERTY OF
L. E. BLANKENSHIP
E ST.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C48	.047	400	SK490232	P488-047	DF-503	PTR4S47		PT147	47M-S47	
C49	470		21R116554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C50	470		21R116554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C51	470		21R116554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C53	470		21R116554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C53	470		21R116554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C54	470		21R116554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C55	1000		21R410127	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C56	68		21R400930							
C57	3.3		21R115949							
C58	30		21R410048							
C59	.3	400	SK490299	P488-22		PTE4P23		PT403	47M-P22	
C60	5000		21R121106	BPD-002	DD-303	TM5D2	801-002	DC-523	5HK-D2	
C61	.1	200	SK490210	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C62	10000		21R482736	BPD-01	DD-103	TM5E1	811-01	DC-511	5HK-S1	
C63	10000		21R482736	BPD-01	DD-103	TM5E1	811-01	DC-511	5HK-S1	
C64	.001	1000	SK490266	P1088-001		PTK16D1		PT1621	MB-D1	
C65	.047	200	SK490306	P488-047	DF-503	PTE4S47		PT447	47M-S47	
C66	3.3		21R115949							
C67	10		21R120161	SM0M750	TCM-10		N750K-100	NT-541	5TCU-Q1	
C68	68		21R400930							
C69	5000		21R115312	BPD-005	DD-503	TM5D5	811-005	DC-525	5HK-D5	
C70	5000		21R115312	BPD-005	DD-503	TM5D5	811-005	DC-525	5HK-D5	
C71	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C72	470		21R410121	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C73	1000		21R410127	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C74	47000		21R115867	SI4700	D6-473	TM5D5	GP2-333-472	DC-525	5HK-D47	
C75	5000		21R115313	BPD-005	DD-503	TM5D5	811-005	DC-525	5HK-D5	
C76	470		21R410121	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C77	10000		21R482736	BPD-01	DD-103	TM5E1	811-01	DC-511	5HK-S1	
C78	4700		21R115867	SI4700	D6-472	TM5D5	GP2-333-472	DC-525	5HK-D47	
C79	4700		21R115867	SI4700	D6-472	TM5D5	GP2-333-472	DC-525	5HK-D47	
C80	4700		21R120149	BPD-0047	D6-472	TM5D5	GP2-333-472	DC-525	5HK-D47	
C81	.05	600	SK490228	P688-02	DF-203	PTE5S2		PT603	6TM-S2	
C82	470		21R410121	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C83	.047	400	SK490232	P488-047	DF-503	PTE4S47		PT447	47M-S47	
C84	.0047	600	SK490249	P688-0047	D6-472	PTK6D47	GP2-333-472	PT6247	6TM-D47	
C85	.0047	600	SK490249	P688-0047	D6-472	PTK6D47	GP2-333-472	PT6247	6TM-D47	
C86	.05	400	SK490230	P488-05		PTE5S3		PT503	5TM-S3	
C87	4700		21R115867	SI4700	D6-472	TM5D5	GP2-333-472	UC-525	5HK-D47	
C88	.047	400	SK490232	P488-047		PTE4S47		PT447	47M-S47	
C89	.015	200	SK49234	P488-015						
C90	.15	400	SK490298	P488-15		PTK4P15		PT4015	4TM-P15	
C91	.01	600	SK490907	P688-01	D6-103	PTK6S1	GP2-333-103	PT61	6TM-S1	
C92	470		21R410121	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C93	470		21R116554	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C94	470		21R410121	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C95	1000		21R118749	SID100	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C96	1000		21R118749	SID100	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C97	.0047	400	SK490232	P688-0047	D6-472	PTK6D47	GP2-333-472	PT6247	5TM-D47	
C98	.001	1000	SK490258	P1088-001		PTK6D1		PT6221	MB-D1	
C99	.0033	600	SK490247	P688-0033	D6-332	PTK6D33	GP2-333-332	PT6233	6TM-D33	
C100	.01	600	SK490907							
C101	180									Note 1
C102	.0047	400	SK490232							
C103	390	500	21R114740	1469-0004		5RT4			MS-34	
C104	270	500		1469-0003		5RT3			MS-33	Note 2
C105	.039	400	SK490985							
C106	.0047	400		P688-0047	D6-472	PTK6D47	GP2-333-472	PT6247	6TM-D47	
C107	.1	200	SK490210	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C108	.1	400	SK490236	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C109	150	5000								Note 1
C110	.22	200		P488-22		PTE4P22		PT4122	4TM-P22	Note 3
C111	500	20000	21A721991	HV20C	TV3-502	MM-C20T5	413-561	HV20035A	20DK-T5	
C112	.022	600		P688-022		PTK6S22		PT6122	6TM-S22	Note 3
C113	.1	600		P688-1		PTK6P1		PT601	6TM-P1	Note 3
C114	82	1500								
C115	.01	1000	SK490278	P1088-01		PTK1D01		PT1611	MB-S1	
C116	.047	400		P488-047		PTE4S47		PT4147	47M-S47	Note 4

Note 1. Chassis coded prior to -.03 use 100MMF in this application.
Note 2. Chassis coded prior to -.03 use 470MMF in this application.
Note 3. Not used in chassis coded prior to -.03.
Note 4. Not used in all Models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	18A711999	Q11-137	AG-61-8	BT5K-72	U-54	Tone
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R1A
R2A	2000Ω	½	18K731031	* QJ-512				Contrast tapped at 1500-panel
B	1Meg		Not Req.	Not Req.				Volume & Switch tapped at 230K rear
R3A	1Meg	½	18K731054	Q11-137	AG-61-8	BT5K-72	U-54	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R3A
R4A	2Meg	½	18A731028	Q11-139	AG-83-8	AB-75	U-56	Vert. size
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A
R5A	2000Ω	4	18A731030	4WK-2000	AG-3000		MEMPK	Focus wire wound
B	Shaft		Not Req.	Not Req.	KS8-3		DS38	Attach to R5A
R6A	100KΩ	½	18K731033	Q11-129	AG-49-8	AB-60	U-43	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R6A
R7A	2000Ω	½	18A731029	Q11-110	AG-11-8	AB-5	U-6	Vert. Linearity
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R7A
R8A	300KΩ	½	18K731043	Q11-139	AG-52-8	AB-46	U-43	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT KIT K-4 BASE ELEMENTS & SHAFTS B17-110X & P10-306 (Panel) B13-137X & R13-331 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	IRC PART No.	NOTES
R9	1Meg	½	GR6004	BTS-1Meg	
R10	1Meg	½	GR6004	BTS-1 Meg	
R11	56Ω	½	GR5614	BTS-56	
R12	220Ω	½	GR6370	BTS-220	
R13	56KΩ	½	GR6378	BTS-56K	
R14	18KΩ	½	GR5591	BTS-18K	
R15	2700Ω	½	GR5577	BTS-2700	
R16	22KΩ	½		BTS-22K	
R17	47KΩ	½		BTS-47K	
R18	1800Ω	2		BTS-1800	
R19	2200Ω	3		BTB-2200	
R20	620KΩ	½		BTS-620K	
R21	680KΩ	½		BTS-680K	
R22	1000Ω	1		BTA-1000	
R23	12KΩ	½		BTS-12K	
R24	820Ω	½		BTS-820	
R25	1200Ω	½		BTS-1200	
R26	22KΩ	½		BTS-22K	
R27	22KΩ	½		BTS-22K	
R28	560KΩ	½		BTS-560K	
R29	15KΩ	½		BTS-15K	
R30	22KΩ	2		BTB-22K	
R31	1000Ω	1		BTB-1000	
R32	10KΩ	½		BTS-10K	
R33	15KΩ	½	GR6477	BTS-15K	
R34	18KΩ	½	GR5591	BTS-18K	
R35	470Ω	½	GR3949	BTS-470	
R36	47Ω	½	GR5550	BTS-47	
R37	470Ω	½	GR3949	BTS-470	
R38	470Ω	½	GR3949	BTS-470	
R39	12KΩ	½	GR6394	BTS-12K	
R40	47Ω	½	GR5550	BTS-47	
R41	470Ω	½	GR3949	BTS-470	
R42	470Ω	½	GR3949	BTS-470	
R43	1.2Meg	½		BTS-1.2Meg	
R44	39KΩ	1	GR5588	BTA-39K	
R45	5600Ω	½	GR6117	BTS-5600	
R46	120Ω	½	GR5581	BTS-120	
R47	470Ω	½	GR3949	BTS-470	
R48	100KΩ	½	GR6075	BTS-100K	
R49	4700Ω	½	GR6080	BTS-4700	
R50	37KΩ	½	GR6434	BTS-37K	
R51	470Ω	½	GR6090	BTS-470	
R52	18KΩ	3	GR476014	BTB-18K	
R53	5000Ω	5	17R131123		
R54	150KΩ	½	GR6398	BTS-150K	
R55	1Meg	½	GR6004	BTS-1Meg	
R56	220KΩ	½	GR6015	BTS-220K	
R57	100KΩ	½	GR6075	BTS-100K	
R58	100KΩ	½	GR6075	BTS-100K	
R59	1800Ω			BTS-1800	Note 1
R60	470Ω	½	GR6032	BTS-470K	
R61	1Meg 5%	½	GR6587	BTS-1Meg 5%	
R62	180KΩ 5%	½	GR2061	BTS-180K 5%	
R63	100KΩ	½	GR6075	BTS-100K	
R64	10KΩ	½	GR6330	BTS-10K	
R65	22KΩ	2	GR3098	BTB-22K	
R66	47KΩ	1	GR6048	BTA-47K	
R67	39KΩ	½	GR6487	BTS-39K	
R68	120KΩ	½	GR5631	BTS-120	
R69	330KΩ 5%	½	GR400067	BTS-330K 5%	
R70	39KΩ 5%	½	GR400076	BTS-39K 5%	
R71	10KΩ	½	GR6054	BTS-10K	

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	IRC PART No.	NOTES
R72	15KΩ	½	GR6431	BTA-15K	
R73	22KΩ	½	GR6270	BTS-220	
R74	47KΩ	½	GR6048	BTS-47K	
R75	22KΩ	½	GR6397	BTS-22K	
R76	100KΩ	½	GR6331	BTS-1000	
R77	180Ω	½	GR5660	BTS-180	
R78	33KΩ	½	GR6410	BTS-33K	
R79	6800Ω	½	GR6438	BTS-6800	
R80	6800Ω	½	GR6428	BTS-6800	
R81	68KΩ	½	GR6061	BTS-68K	
R82	1.7Meg	½	GR2122	BTS-1.7Meg	
R83	470KΩ	½	GR6032	BTS-470K	
R84	470KΩ	½	GR6032	BTS-470K	
R85	330Ω	½	GR6023	BTS-330	
R86	1500Ω	2	GR2015	BTB-1500	
R87	820Ω	2		BTB-820	
R88	2000Ω	10	17R120045	1 3/4A-2000	
R89	820KΩ	½	GR6429	BTS-820K	
R90	100KΩ	½	GR6075	BTS-100K	
R91	33KΩ	½	GR6330	BTS-33K	
R92	220KΩ	½	GR6407	BTS-220K	
R93	22KΩ	½	GR6341	BTA-22K	
R94	100KΩ	½	GR6031	BTS-100K	
R95	560KΩ	½	GR5697	BTS-560K	
R96	22KΩ	½	GR6028	BTS-22K	
R97	220Ω	½	GR6069	BTS-2200	
R98	33KΩ	½	GR6400	BTA-33K	
R99	2200Ω	½	GR6069	BTS-2200	
R100	180KΩ	½	GR6444	BTS-180K	
R101	4700Ω	½	GR6059	BTS-4700	
R102	220KΩ	½	GR6407	BTS-220K	
R103	.47Ω	½	17K488266		
R104	390KΩ	½	GR5646	BTS-390K	
R105	100KΩ	½		BTA-100K	Note 2
R106	100KΩ	½	GR6031	BTS-100K	
R107	10KΩ	½	GR6330	BTS-10K	Note 3
R108	560KΩ	½	GR5697	BTS-560K	
R109	1000Ω	½	GR6229	BTS-1000	
R110	330Ω	2	GR488037	BTB-330	
R111	18Ω	½	GR2031	BTS-18	
R112	18Ω	½	GR2031	BTS-18	
R113	1000Ω	½	GR6229	BTS-1000	
R114	100KΩ	½	GR6075	BTS-100K	
R115	100KΩ	½	GR6075	BTS-100K	
R116	100KΩ	½	GR6075	BTS-100K	
R117	22KΩ	½	GR6397	BTS-22K	
R118	4.7Meg	½	GR2122	BTS-4.7Meg	
R119	5600Ω	½	GR6117	BTS-5600	
R120	120KΩ	½	GR6193	BTS-120K	
R121	100KΩ	½	GR6075	BTS-100K	
R122	120KΩ			BTS-120K	Note 2
R123	10KΩ	½		BTS-10K	Note 4
R124	1Meg	½	GR6004	BTS-1Meg	
R125	27Ω	2			Note 5
R126	10KΩ	10		1 3/4A-10K	Note 6
R127	47KΩ	1	GR6483	BTA-47K	
R128	10KΩ	2		BTB-10K	
R129	3.3Ω	½	17E485412		
R130	6.8Ω	½			
R131	5Ω	5	1K711574		Note 7
R132	270Ω	1			
R133	470KΩ	¼			

Note 1. Some models may use a 10KΩ resistor in this application.
Note 2. Some models may use a 82KΩ resistor in this application.
Note 3. Some models may use a 22KΩ resistor in this application.
Note 4. Some models may use a 4700Ω resistor in this application.
Note 5. Some models may use a 47Ω resistor in this application.
Note 6. Some models may use a 750Ω resistor in this application.
Note 7. Some models may use a 7.5Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	RCA TYPE No.
T1	①②③ 117VAC	6.3VAC			25B730922					
	②A tap ②120VAC	12.5A								
	③1.24A									

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	47Ω	255Ω	25B721871	A-8125 ②	A-3003 ①②	B670X ⑫	A-97X ⑬		Vert.Osc. Trans.
T3	171.5Ω tap ④.5Ω 9.5Ω, 16.5Ω	3Ω tap ④ 1.8Ω SEC. 2 0Ω	24K731615 ④ 1D731046 ⑤						Horis.Output Trans.
T4	435Ω tap ⑥ 44Ω		25B730923	A-8140 ⑨ ⑪			Z1805 ⑪ ⑰		Vert.Output Trans.
T5A	15Ω		24D731010						Horis.Deflection Coils
B	3Ω								Vert.Deflection Coils
T6	1.05Ω		34C731008		MF-5 ⑧			B-1000-8 ⑫	Focus Coil
T7A	36Ω		⑭						Width Coil
B	4Ω		24B731090 ⑮						Width Coil

① Drill one new mounting hole.
② Connect blue lead to cathode, red lead to ground, yellow lead to grid, green lead to integrator network.
③ Connect red lead to cathode, blue lead to ground, yellow lead to grid, green lead to integrator network.
④ Used in Ch. coded - 03 only.
⑤ Alternate horiz onal output trans.
⑥ Drill new mounting holes.
⑦ Connect as auto transformer
⑧ Fabricate new mounting bracket or use original coil case.
⑨ Fabricate new mounting bracket.
⑩ Alternate width coil.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	MOTOROLA PART No.	VIKING PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	NOTES
T8	5.2KΩ	3.4Ω	670Ω	.73Ω	25K721878 25B721872 ①	A-3877 ②	A3019	Z1002	S-5Z	① Alternate audio out-put ② Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	MOTOROLA PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	10"	50.6Ω	3.4Ω	50C730275 20C731305 ①	10J11	10A31	① Alternate 10" EM speaker ② Used in models 27K3, 27K3, Y27K2, and Y27K3.
B	12"	50.6Ω	3.4Ω	50C731206 ②	12J11	12A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	UHF Ant. Coupling	00CT		1Y730900				Includes R2, R3, C5, C9
B	RF Coupling							
	Loop	0Ω		24B730674				
L2	Fil. Choke	0Ω		24K712254				
L3	Fil. Choke	0Ω		24K712254				
L4	Cathode Choke	0Ω		24K721430				
L5	Osc. Coil	0Ω		24B730126				Less tuning core assembly; tuning core assembly Part # 1B730885
L6	RF Choke	1.6Ω		24K712103				
L7	Ant. Trans.		.7Ω	24K730677				
L8			.7Ω	24K730677				
L9	FM Trap	0Ω		24A721863				
L10	IF Trap	0Ω		24A731357				
L11	Ant. Coils	0Ω		24K722265				
L12	Ant. Shunt Coils	0Ω		24K722232				
L13	UHF IF Input Coil	0Ω		24A730748				
L14	Fil. Choke	0Ω		24A721274				
L15	Neutr. Coil	0Ω		24C722228				
L16	RF Coil	0Ω		24K722231				Channel 13
L17	RF Coils	0Ω		24C722262				
L18	UHF RF Coil	0Ω		24K722229				
L19	Mixer grid coil	0Ω		24A730100				Channel 13
L20	Mixer grid coils	0Ω		24K722263				
L21	UHF Mixer grid coil	0Ω		24A721855				
L22	Fil. Choke	0Ω		24A721274				
L23	Osc. Coil	0Ω		24K722233				Channel 13
L24	Osc. Coils	0Ω		24K722264				
L25	Video IF Coupling	0Ω		24B721869	17-4523 *		6219 *	Includes core; core Part # 46K722164
L26	1st Video IF	0Ω		24B721869	17-4523 *		6219 *	.5Microhenry
L27	Fil. Choke	0Ω		24A730181	19-3001	TV-186	6175	Includes trap & core
L28	2nd Video IF	0Ω	0Ω	24B721953			6233 †	Part # 46K722164 .5Microhenries
L29	Fil. Choke	0Ω		24A730181	19-3001	TV-189	6175	Includes trap & core;
L30	3rd Video IF	0Ω	.1Ω	24B721951			6232 †	Part # 46K722164
L31	4th Video IF	.1Ω	.1Ω	24B721949				Includes 1N48 crystal 2-4.7MMF capacitors, Series Peak. coil & core; core Part # [illegible]
L32	Series Peak. Coil	3.1Ω		24R119838	19-3075		6172	67 Microhenries
L33	Shunt. Peak. Coil	8.5Ω		24R119855	19-3300		6155	330 Microhenries

(CONT'D ON NEXT PAGE)

MOTOROLA MODELS Y24K1, B, Y24K2, B, Y24K3, W, Y27K2, B, Y27K3 (Ch. TS602Y), 24K1, B, 24K2, B, 24K3, W, 27K2, B, 27K3 (Ch. TS602)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L34	4.5MC trap	2.3Ω		1V792736	20-1004	TV-1515	1470	Includes core; core Part # 46A470310
L35	Series Peak. Coil	5Ω		24R120887	19-3125 ■	TV-182	6153 ■	132 Microhenries; wound on 15KΩ resistor
L36	Shunt. Peak. Coil	6Ω		24R119869	19-3250 ■	TV-185 ■	6154 ■	275Microhenries; wound on 15KΩ resistor
L37	1st Sound IF	1.1Ω		1V790341	17-3400	TV-151	1469	Includes core; core Part # 46A470310
L38	2nd Sound IF	1.1Ω		1V790341	17-3400	TV-151	1469	Includes core; core Part #46A470310
L39	Ratio Det.	2.6Ω	.4ΩCT	24K730103	17-1033 ▲	TV-110 ▲	1468 ▲	Tertiary winding=.2Ω Includes core; core Part # 46K702437
L40	Horiz. Osc.	39Ω		24K721064	19-1575	TV-163 ♦	6210 ♦	Includes core; core Part # 46A780344

* Use one winding only.
† Drill mounting holes and use a daptor plate.
▲ Drill mounting holes.
♦ Enlarge mounting hole.
■ Parallel with 15KΩ resistor.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA MOTOROLA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	NOTES
M1	.260ADC	48B721493	5S2	1021	6S450	450	
M2	.050ADC	48B730744	5M4	1003	6S75	75	
M3	.190ADC	48B700555	6Q4	1090A	6S300	300	
M4	.130ADC	48B700555	6Q4	1090A	6S300	300	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA MOTOROLA PART No. FUSE	MOTOROLA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M5			Piece of #26 wire one inch long (Filament Fuse)					

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA MOTOROLA PART No.	SYLVANIA PART No.		NOTES
M6	1N82	48K731312 or 48K731313 or 48K731314	1N82 or 1N82A		UHF Mixer (clip in)
M7	1N48	48C711052	1N34 or 1N34A		Video detector (pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M8	Dial light	65X10867	Station indicator # 44 bayonet
M9	Tuner	TT-37	UHF-620Y chassis
M10	Tuner	1U731306	VHF-VTT42Y used with 602Y chassis
M11	Tuner	1U730863	VHF-VTT42 used with 602 chassis
M12	Switch	40A722103	Area selector (agc-rotary type)
M13	Ion trap	24A702047	
	Cabinet	16F730698	Mahogany console model 24K1 & Y24K1
	Cabinet	16K730699	Limed oak console model 24KB & Y24K1B
	Cabinet	16F730830	Mahogany console model 24K2& Y24K2
	Cabinet	16K730831	Limed oak console model 24K2B & Y24K2B
	Cabinet	16F730936	Mahogany console model 27K2 & Y27K2
	Cabinet	16K730937	Limed oak console model 27K2B & Y27K2B
	Cabinet	16F731067	Mahogany console model 27K3 & Y27K3
	Knob	36K730174	VHF channel selector (chassis 602)
	Knob	36B730171	VHF channel selector (chassis 602Y)
	Knob	36C730162	Contrast
	Knob	36B730158	(2) fine tuning and off-on volume
	Knob	36C730167	Tone
	Knob	36B712294	Area selector (rear of chassis)
	Knob	36B730229	(3) horiz. hold, vert. hold and brightness
	Knob	34C730165	UHF channel indicator (chassis 602Y)
	Safety glass	61K730812	24" models
	Safety glass	61K730813	27" models

PROPERTY OF
L. F. BLAINE SHIP
DENVER, COLORADO

TROUBLE SHOOTING AIDS (cont)

POWER

DEAD SET

If filaments fail to light, check fuse M5, AC interlock assembly, switch on volume control and T1. If filaments light, check R131, M1, M2, M3, M4 and other components associated with the B+ filter and decoupling network.

SMALL AND/OR DIM PIX

Check B+ rectifiers M1, M2, M3 and M4. Check C1, C2A, C3D and other associated circuit components for failure or change of value.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V17, V18, V19 and V20. Check waveform W19.

If Satisfactory	If Unsatisfactory
Check C111, R129, T3, T5A, C108, R125 and other associated components.	Check C101, C102, C103, C104, C105, C106, R122, R124 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19 and V20. Check picture tube. Measure B+.

If Satisfactory	If Unsatisfactory
Proceed as outlined under "Loss of High Voltage".	Follow procedure outlined under "Small and/or Dim Pix".

BLOOMING

Check by substitution V17, V18, V19 and V20. Check T3, T5A, C111, R129, C108, R126 and other associated circuit components for failure or change of value.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V2, V3, V4, V5, V6 and V7. Check associated circuit components.

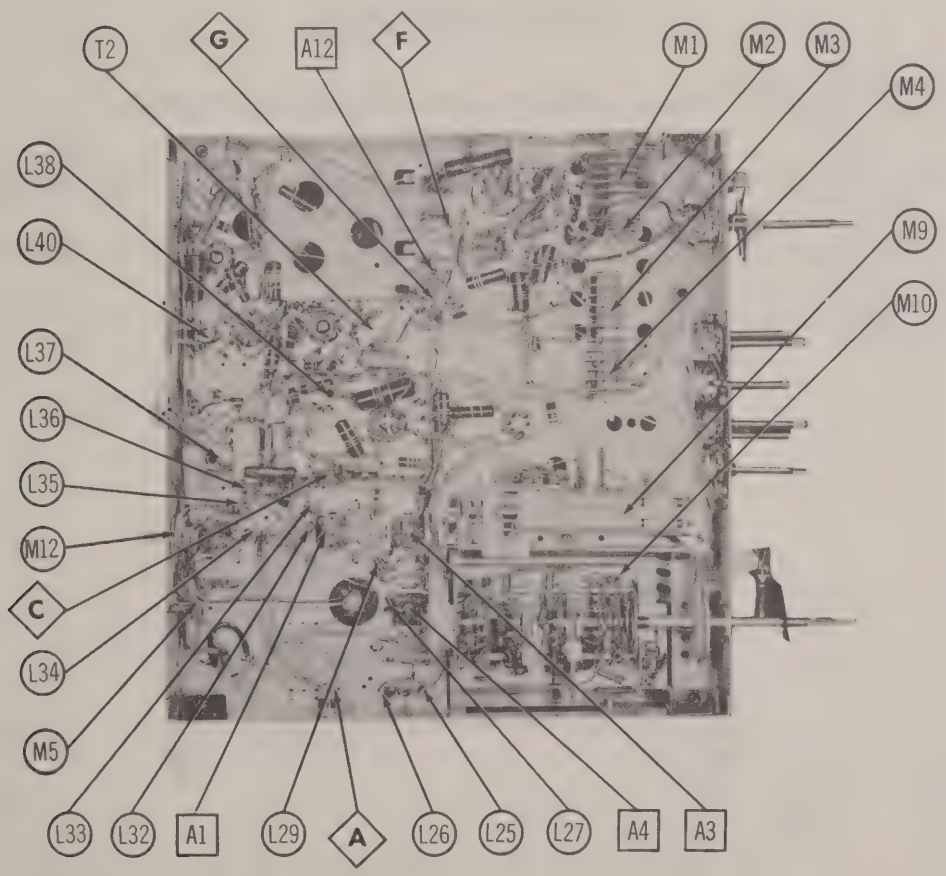
NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

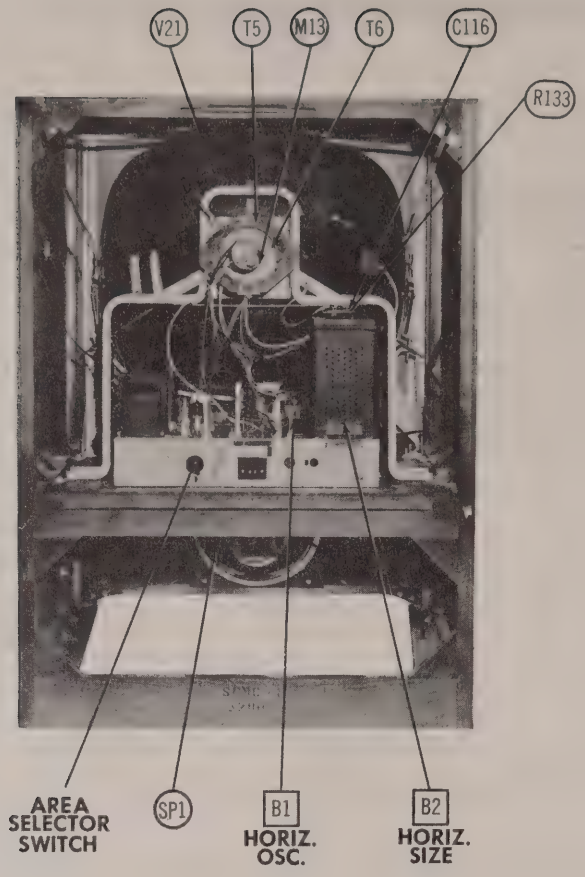
INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION



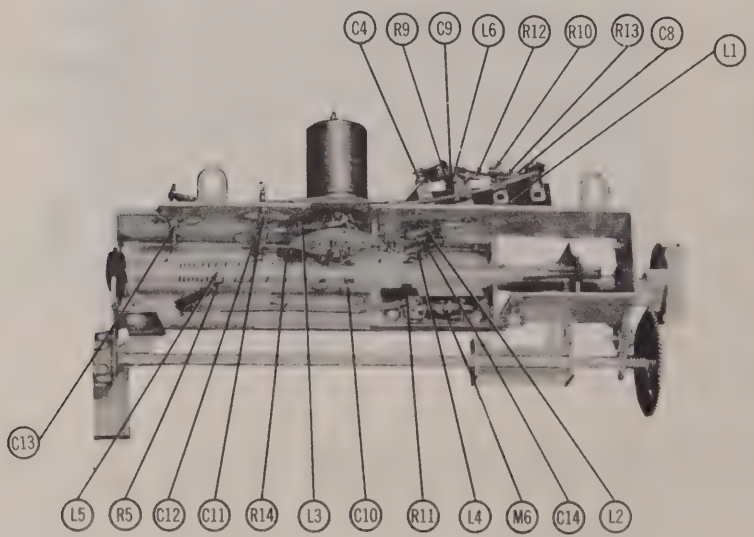
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

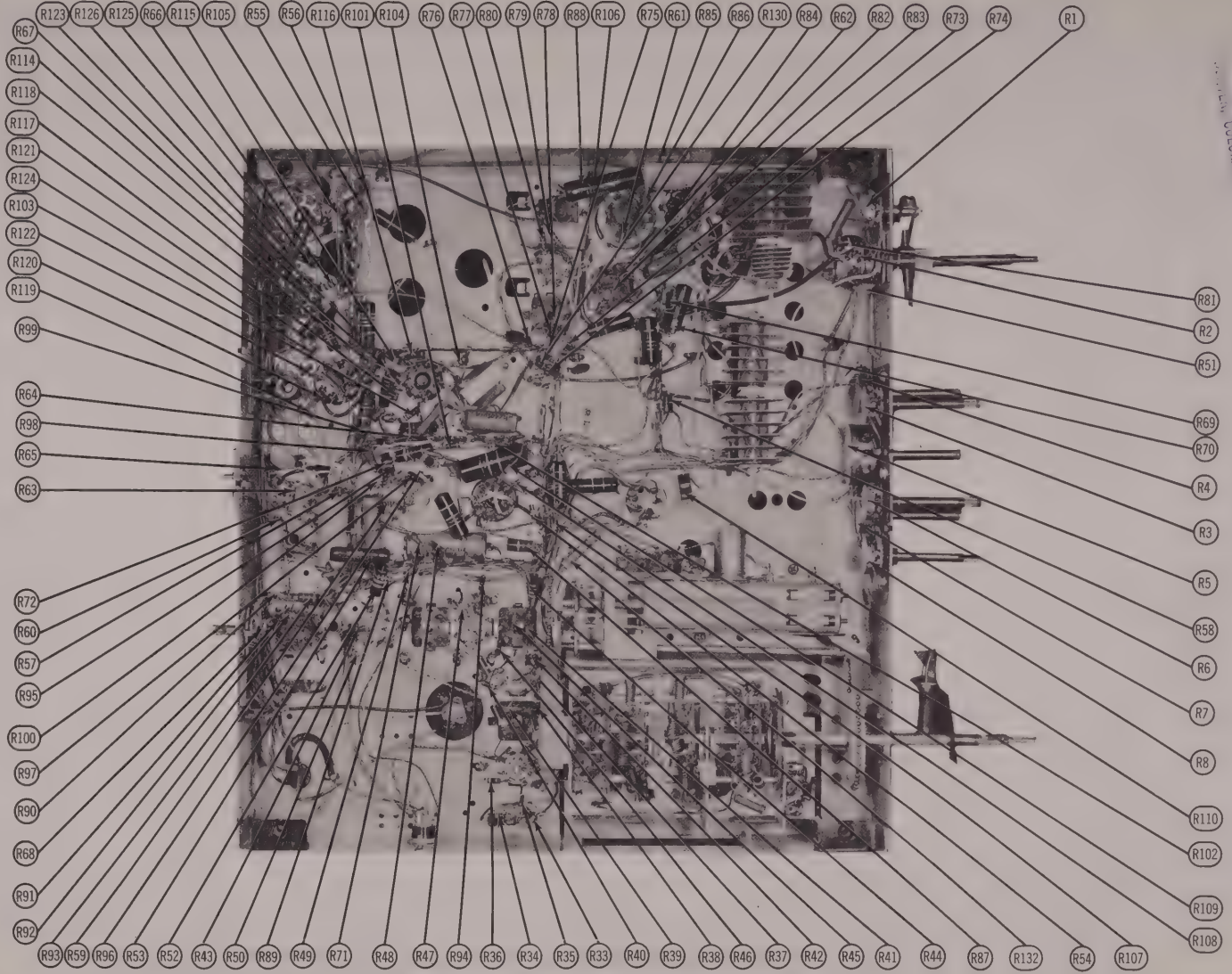
Turn the set on and tune in a TV station, preferably a test pattern.
Normally the horizontal hold control will have a sync range of approximately 70 degrees. If the control is too critical, adjust as follows:

1. Shunt the horizontal oscillator coil (L40) to ground with . 25MFD, 400 volt capacitor. This may be done without removing chassis from cabinet by placing the capacitor across the two pin test receptacle on rear of chassis.
2. With the horizontal centering lever, move the picture to the left so that the right edge of the raster is seen. Adjust the horizontal hold control until the approximate center of the blanking pulse falls on the edge of the raster. (The blanking pulse appears as a gray bar at the right edge of the raster. It may be necessary to adjust the contrast and the brightness so that pulses are visible).
3. Remove the . 25MFD capacitor from across the horizontal oscillator coil.
4. Adjust the horizontal size slug (B2) for a picture that is slightly wider than necessary to fill the picture mask horizontally.

Set the AREA SELECTOR switch to the position which gives the clearest picture and best sound.



UHF TUNER



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of RF Tuner oscillator circuit , it is necessary to remove the chassis from the cabinet. (See Disassembly Instructions).

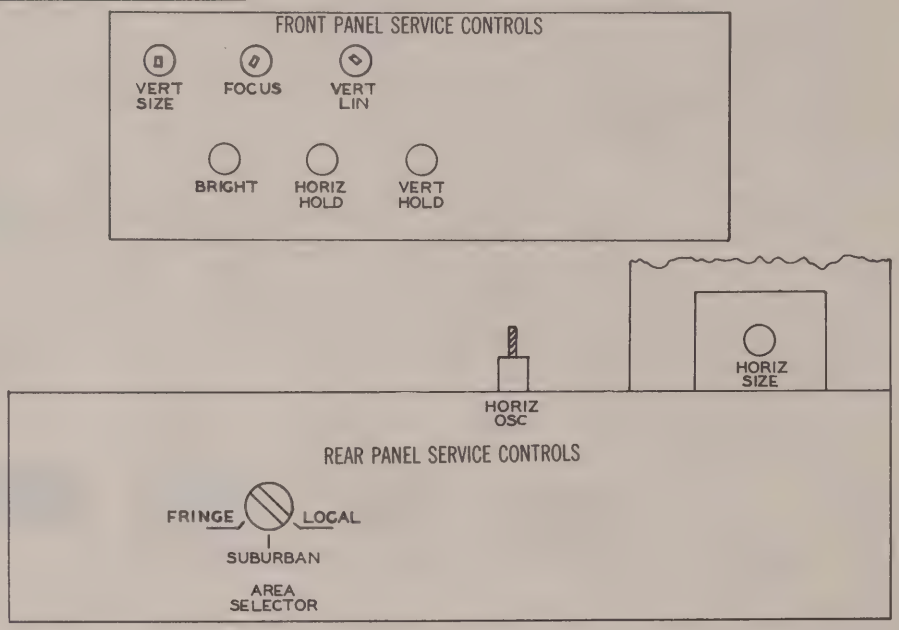
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - AREA SELECTOR SWITCH

Set the Area Selector switch to the position which gives the clearest picture and best sound.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. Osc. slug L40 until, picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L39) located on bottom of chassis. (See tube placement chart).

FUSES

One fuse is used for Filament protection. (For location see tube Placement Chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the E.M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

BUILT-IN ANTENNA TUNING

Built-in antenna can be adjusted from rear of cabinet. Adjust for a picture of maximum contrast and minimum ghost.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

DISASSEMBLY INSTRUCTIONS

Remove 9 push on type control knobs from front panel.

Disconnect built-in antenna.

Remove 6 wood and 1 metal screws and 1 push on type control knob. Remove rear cover.

Disconnect yoke plugs, focus plug, transmission line plugs, chassis ground nut from yoke frame, CRT plug, HV plug, and speaker plug.

Remove 4 chassis bolts. Remove chassis.

Remove 4 speaker nuts. Remove speaker.

PROPERTY OF
L. F.
DENVER, COLORADO

ANTENNA
STAND BY SWITCH
ANL OFF SWITCH
MAIN TUNING CONTROL
PITCH CONTROL
BAND SPREAD
SENSITIVITY CONTROL
BAND SELECTOR SWITCH
TONE SWITCH
CW SWITCH
VOLUME CONTROL ON-OFF SWITCH

NATIONAL
MODEL NC-88

TRADE NAME	National Model NC-88	
MANUFACTURER	National Co., Inc., 61 Sherman St., Malden 48, Mass.	
TYPE SET	AC Operated 4-Band Superheterodyne Communications Receiver	
TUBES (Nine)	Types 6BA6 RF Amp., 6C4 Osc., 6BE6 Mixer, (2) 6BD6 IF Amp., 6AL5 Det.-AVC-Noise Limiter, 12AX7 CW Osc.-AF Amp., 6AQ5 Audio Output, 5Y3GT Rectifier	
POWER SUPPLY	105/130 Volts AC-50/60 Cycles	RATING .56 Amp. @ 117 Volts Ac
TUNING RANGE	Band "A"—540-1600KC Band "B"—1.6-4.7MC	Band "C"—4.7-14.0MC Band "D"—14.0-40MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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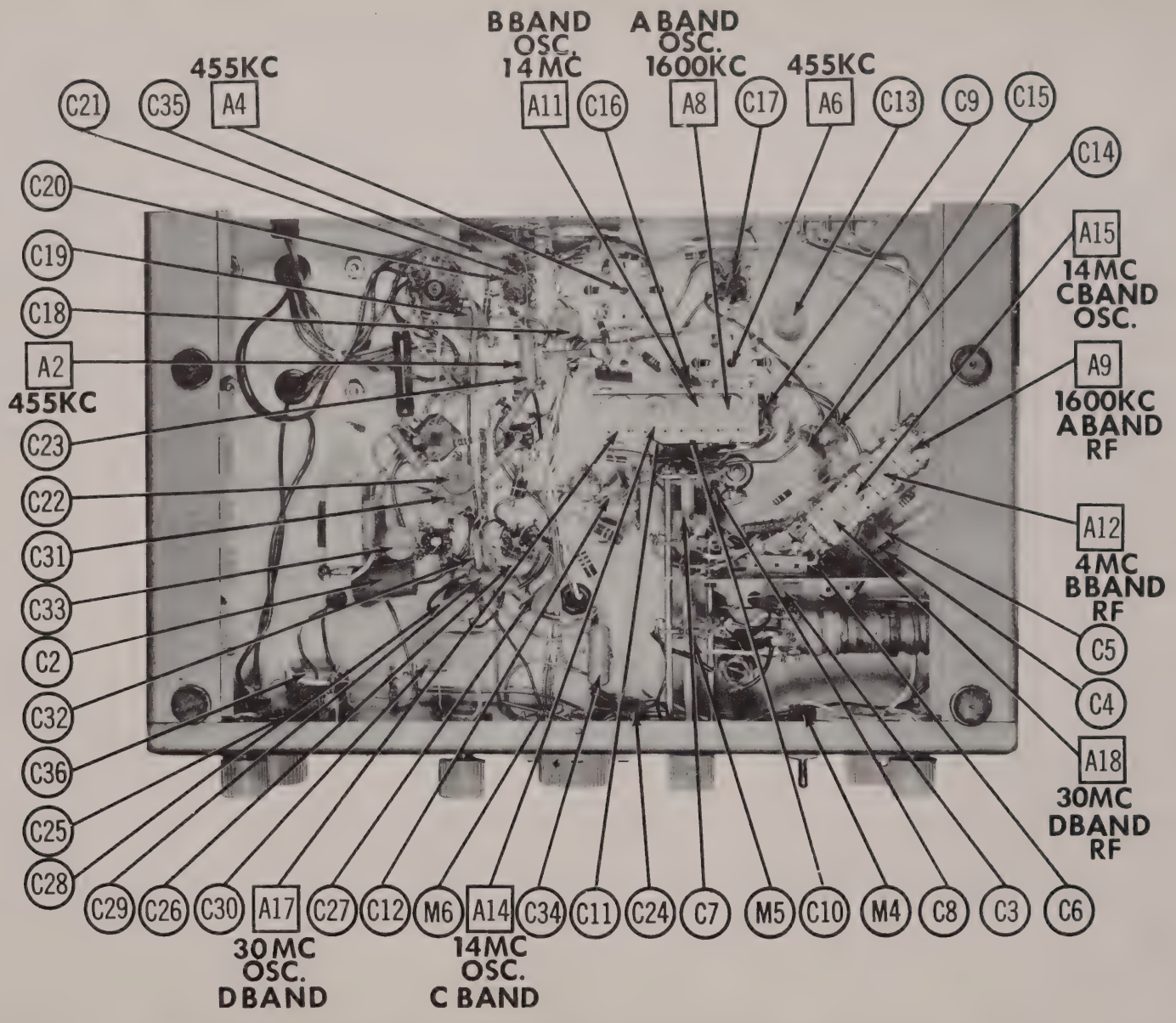
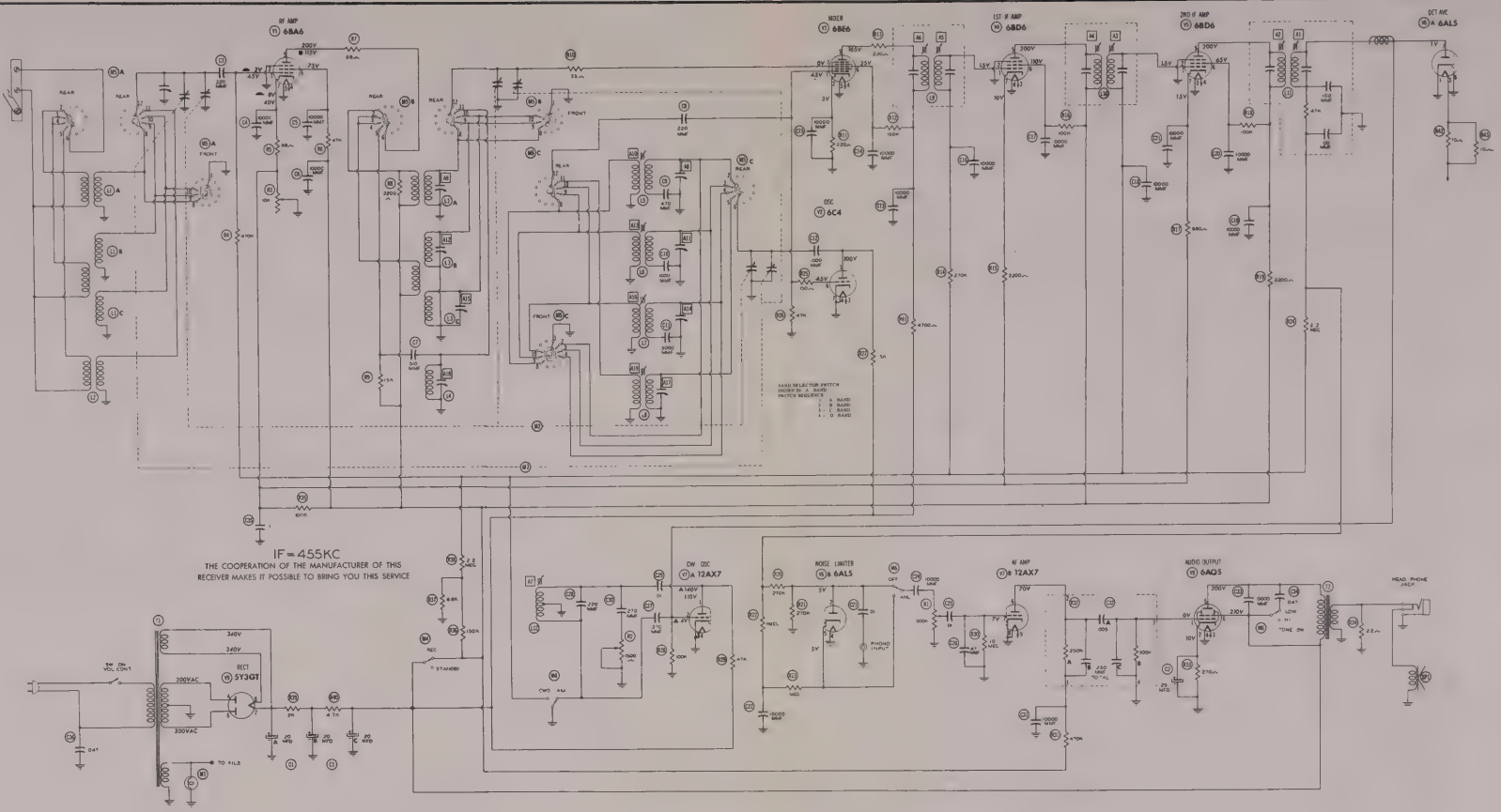


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	1.8Meg	0Ω	0Ω	.1Ω	237KΩ †245KΩ	†50KΩ	680Ω - 10KΩ		
V 2	6C4	†22KΩ	INF	.1Ω	0Ω	†22KΩ	47KΩ	0Ω		
V 3	6BE6	47KΩ	220Ω	0Ω	.1Ω	†188Ω	†180KΩ	35Ω		
V 4	6BD6	1.8Meg	0Ω	.1Ω	0Ω	†2KΩ	†100KΩ	2.2Ω - 12KΩ		
V 5	6BD6	1.3Meg	0Ω	0Ω	.1Ω	†4.2KΩ	†205KΩ	680Ω - 10.5KΩ		
V 6	6AL5	0Ω	270KΩ	2Ω	0Ω	2.5Meg	0Ω	550KΩ		
V 7	12AX7	†50KΩ	100KΩ	0Ω	0Ω	0Ω	†720KΩ	1OMeg	0Ω	.1Ω
V 8	6AQ5	500KΩ	270Ω	.1Ω	0Ω	†2.3KΩ	†2KΩ	500KΩ		
V 9	5Y3GT	INF	1Meg	INF	90Ω	0Ω	0Ω	.1Ω	1Meg	

† MEASURED FROM PIN 2 OF V2
● MEASURED WITH MS ON "D" BAND.
▲ MEASURED IN "CW" POSITION
○ SENSITIVITY AT MINIMUM (FULLY COUNTER CLOCKWISE)
◆ SENSITIVITY AT MAXIMUM (FULLY CLOCKWISE)
VOLTAGE & RESISTANCE MEASUREMENTS TAKEN ON BAND "A" UNLESS OTHERWISE NOTED.

1 DC voltage measurements taken with vacuum tube voltmeter.
All voltages measured at 1000 ohms per volt.
2 Socket connections are shown as bottom view.
3 Line voltage maintained at 117 volts for measurements.
4 Low voltage measurement across resistor voltage readings.
5 Resistor measurements component values with a potential a resistor of .1 Ω in voltage and resistance reading.
6 Tolerance of measured voltages and resistance voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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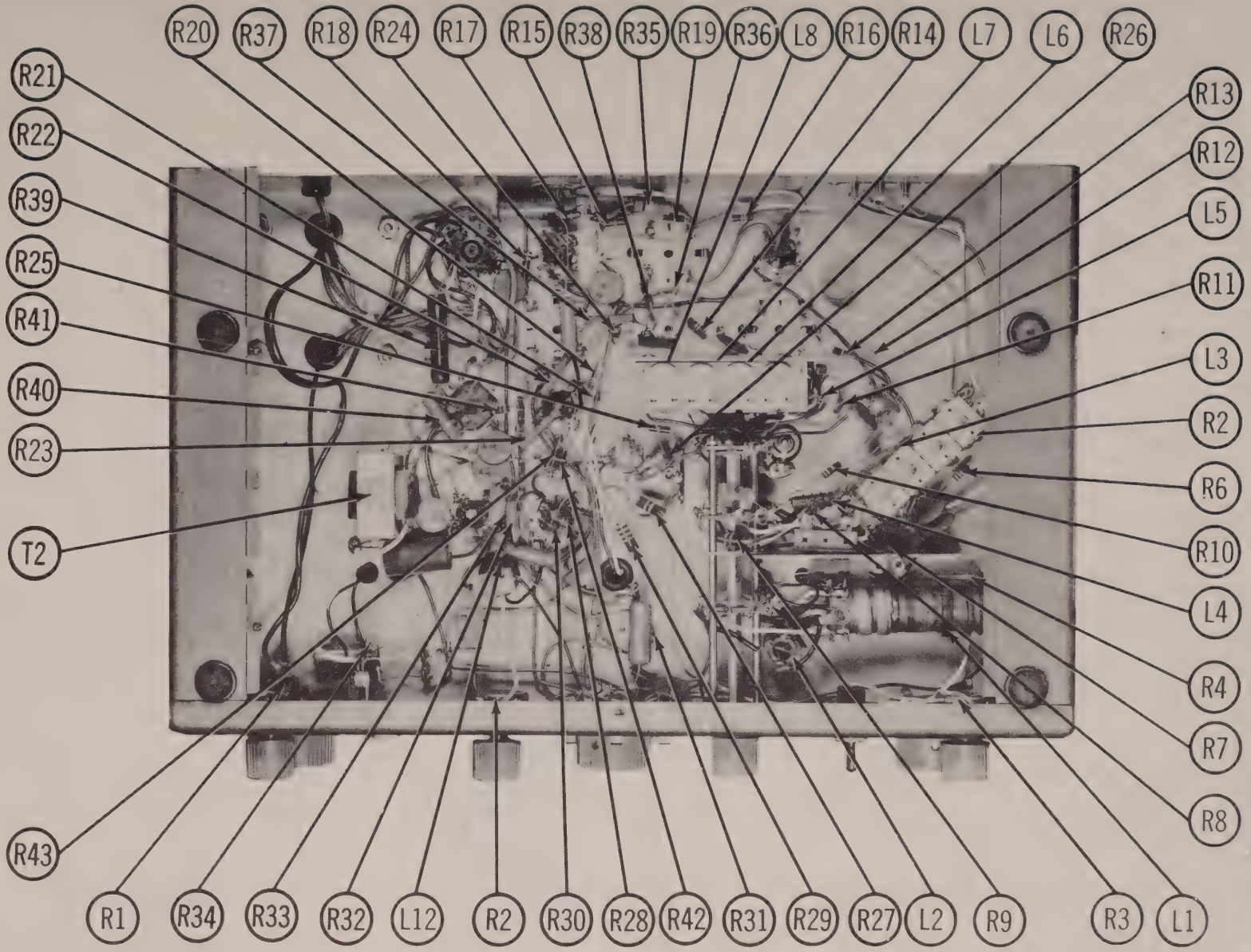
233-7



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3974 MEADE ST
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Remove external antenna and turn sensitivity control fully counter clockwise.
Set the " receive-standby" switch to "receive" position.
Set ANL-off switch to "off" position.
Set AM-CW switch to "AM" position.
Place the band spread pointer on the "set" mark (near 86 on the log scale).
Turn on receiver and test equipment. Allow 15 minute warm up period.

IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to lug on stator plates of center section of center section of main tuning gang. Low side to chassis.	455KC (400~Mod)	"A"	Tuning gang fully open	Across voice coil	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2.	Check alignment of BFO oscillator by placing AM-CW switch to CW position. With pitch control tune BFO for zero beat with signal generator. Zero beat should occur when red dot on pitch control is at the top dead center position. If necessary, set pitch control to place red dot, at the top center position. Adjust A7 for zero beat. Return AM-CW switch to "AM " position.							

RF ALIGNMENT

Incorrect mechanical calibration is indicated when the frequency readings are off a certain equal linear amount on all bands. With the main tuning gang fully closed place the pointer at the first marker on the "C" scale (just to left) of 4. 7MC marker.) With the band spread tuning gang fully closed set pointer to the zero marker on the log scale.
The oscillator operates on the high side on the "A", "B" and "C" bands and on the low side on the "D" band .

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
3.	300Ω Carbon Resistor	High side thru 300Ω to left hand antenna terminal. Low side to chassis (connect link from terminal "G" to middle terminal).	1600KC	"A"	1600KC	Across voice coil	A8, A9	Adjust for maximum deflection.
4.	"	"	600KC	"	600KC	"	A10	Adjust for maximum deflection. Repeat steps 3 and 4.
5.	"	"	4.0MC	"B"	4.0MC	"	A11, A12	Adjust for maximum deflection.
6.	"	"	1.6MC	"	1.6MC	"	A13	Adjust for maximum deflection. Repeat steps 5 and 6.
7.	"	"	14.0MC	"C"	14.0MC	"	A14, A15	Adjust for maximum deflection. If A14 has two peaks use the peak closest to minimum capacity. If A15 has two peaks use the peak closest to maximum capacity.
8.	"	"	5.0MC	"	5.0MC	"	A16	Adjust for maximum deflection. Repeat steps 7 and 8.
9.	"	"	30.0MC	"D"	30.0MC	"	A17, A18	Adjust for maximum deflection. If A17 has two peaks use the peak closest to maximum capacity. If A18 has two peaks use the peak closest to minimum capacity.
10.	"	"	15.0MC	"	15.0MC	"	A19	Turn A19 counter clockwise as far as possible then turn clockwise until second peak is obtained. Adjust for maximum deflection on second peak. Repeat steps 9 and 10.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		NATIONAL PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Oscillator	6C4	6C4	6BG	
V3	Mixer	6BE6	6BE6	7CH	
V4	1st IF Amp.	6BD6	6BD6	7BK	
V5	2nd IF Amp.	6BD6	6BD6	7BK	
V6	Det-AVC-Noise Limiter	6AL5	6AL5	6BT	
V7	CW Oscillator-AF Amplifier	12AX7	12AX7	9A	
V8	Audio Output	6AQ5	6AQ5	7BZ	
V9	Rectifier	5Y3GT	5Y3GT	5T	

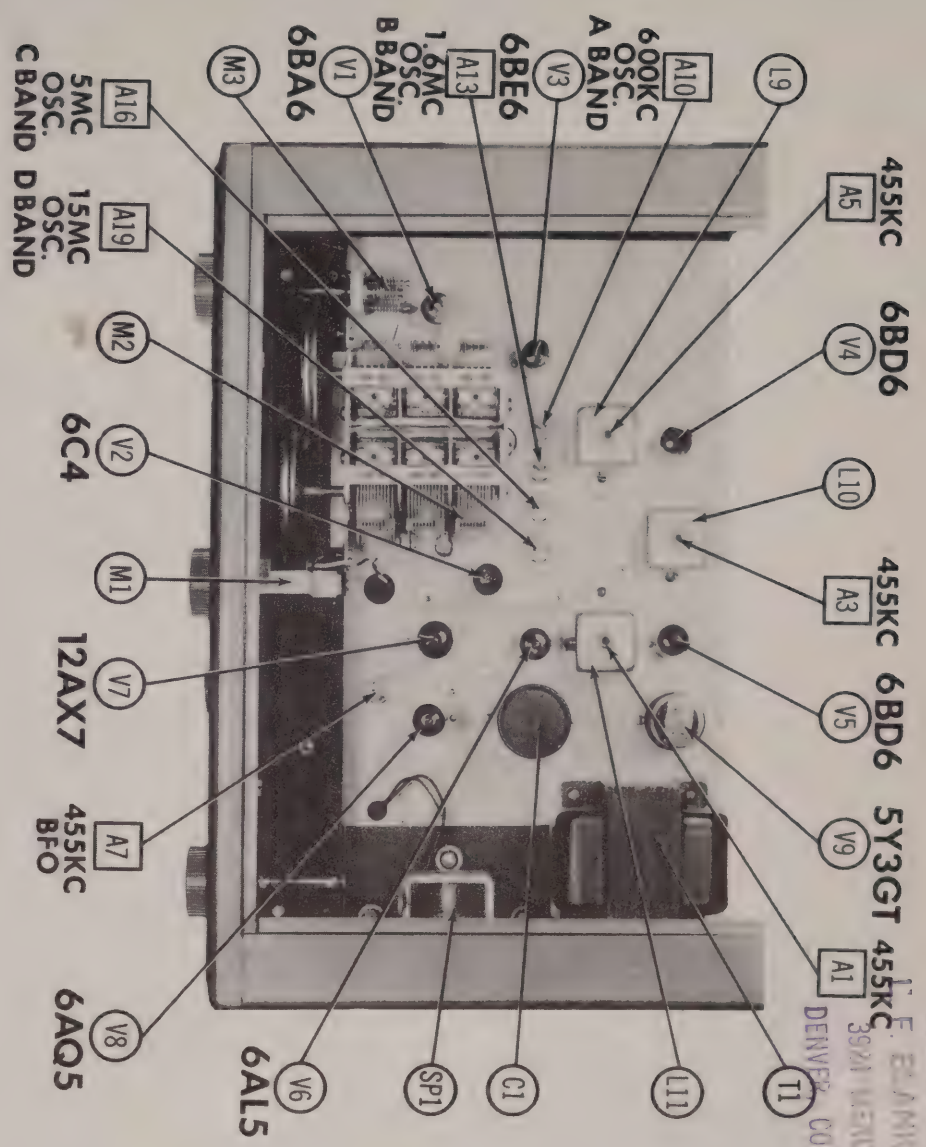
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	NATIONAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲20	450	H325-2	AFH3-36		CO27		FP376.5	TVL-3780	
B	■20	450								
C	▲20	450								
C2	25	50	E338-4	PRS50/25		BR255		TC36	TVA-1306	
C3	220	500	J665-44	1479-00025		5R5T25		MCB240		
C4	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C5	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C6	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C7	510	500	J665-57							
C8	220	500	J665-44	1479-00025		5R5T25		MCB240		
C9	470	500	J665-55							
C10	1000	500	J665-70	1464-001		1R5D1		MCE251	MS-21	
C11	3000	500	J666-30	1464-003		1R5D3		MCE461	MS-23	
C12	1000	500	J665-71	1464-001		1R5D1		MCE251	MS-31	
C13	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C14	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C15	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C16	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C17	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C18	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C19	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C20	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C21	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C22	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C23	.01	400	Q963-19	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C24	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C25	.01	400	Q693-19	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C26	47		D825D-447	SI27	D6-270		GP1K-270	UC-5427	5GA-Q27	
C27	270		J665-47	1479-00025		5R5T25		MCB240		
C28	220	500	J665-44	1479-00025		5R5T25		MCB240		
C29	.01	400	Q693-19	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C30	270	500	J665-47	1479-00025		5R5T25		MCB240		
C31	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C32A	.005									
B	250		*R983-1	*PA-112-2	*PC-71		*1406-02		*104C5	
C										
C33	10000		K946-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C34	.047	400	Q693-28	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C35	.1	400	Q693-34	P488-1		PTE4P1		PT401	4TM-P1	
C36	.047	400	Q693-28	P488-047		PTE4S47		PT4147	4TM-S47	

* Items C32A, C32B, C32C and R32A, R32B are combined in one unit.
When replacing items separately C32B and C32C should total 250MMF.

CHASSIS—TOP VIEW



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PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NATIONAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	K347-1	Q13-133	AG-60-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not,Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	1500Ω	½	K915-16	Q11-110	AG-11-S	B-6	U-6	Pitch
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	10KΩ	2	K349-3		A43-10K		R10, 000L	Sensitivity (Wire wound)
B	Shaft		Not Req.		FS-3		DS36	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	NATIONAL PART No.	IRC PART No.	
R4	470KΩ	½	J569-57	BTS-470K	
R5	68Ω	½	J569-11	BTS-68	
R6	47KΩ	½	J569-45	BTS-47K	
R7	68Ω	½	J569-11	BTS-68	
R8	2200Ω	½	J569-29	BTS-2200	
R9	15KΩ	1	J571-39	BTA-15K	
R10	33Ω	½	J569-7	BTS-33	
R11	220Ω	½	J569-17	BTS-220	
R12	150KΩ	½	J569-51	BTS-150K	
R13	220Ω	½	J569-17	BTS-220	
R14	270KΩ	½	J569-54	BTS-270K	
R15	2200Ω	½	J569-29	BTS-2200	
R16	100KΩ	½	J569-49	BTS-100K	
R17	680Ω	½	J569-23	BTS-680	
R18	100KΩ	½	J569-49	BTS-100K	
R19	2200Ω	½	J569-29	BTS-2200	
R20	270KΩ	½	J569-54	BTS-270K	
R21	270KΩ	½	J569-54	BTS-270K	
R22	1Meg	½	J569-61	BTS-1Meg	
R23	1Meg	½	J569-61	BTS-1 Meg	
R24	2. 2Meg	½	J569-65	BTS-2. 2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	NATIONAL PART No.	IRC PART No.	
R25	150Ω	½	J569-15	BTS-150	
R26	47KΩ	½	J569-45	BTS-47K	
R27	15KΩ	1	J571-39	BTA-15K	
R28	100KΩ	½	J569-49	BTS-100K	
R29	47KΩ	1	J571-45	BTA-47K	
R30	10Meg	½	J569-73	BTS-10Meg	
R31	470KΩ	½	H569-57	BTS-470K	
R32A	250KΩ	½	* R983-1		
B	500KΩ	½			
R33	270Ω	1	J571-18	BTA-270	
R34	22Ω	1	J571-5		
R35	100KΩ	1	J571-49	BTA-100K	
R36	150KΩ	½	J569-51	BTS-150K	
R37	6800Ω	½	J569-35	BTS-6800	
R38	2. 2Meg	½	J569-65	BTS-2. 2Meg	
R39	2000Ω	10	M707-2	1 3/4A-2000	
R40	4700Ω	2	J572-33	BTB-4700	
R41	4700Ω	½	J569-33	BTS-4700	
R42	10Ω	½	J569-1	BTS-10	
R43	10Ω	½	J569-1	BTS-10	

* Items R32A, R32B, C32A, C32B, C32C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	NATIONAL PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.
T1	117VAC ② , 56A	620VCT .064ADC	5VAC ② 2A	6. 3VAC ③ 2. 8A	K-316-2 K-316-5 ①	PC-8408 ② ③	P-3151 ② ③	P9304 ② ③	R-9A ② ③

① Alternate power trans.
② Drill new mounting holes.
③ Tape center tap on 6. 3V winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		NATIONAL PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4. 6KΩ	3. 1Ω	295Ω	. 56Ω	K313-3	A-3877	A-2930	Z1107	S-3X	① Drill one new mtg. hole.

PARTS LIST AND DESCRIPTIONS (Continued)

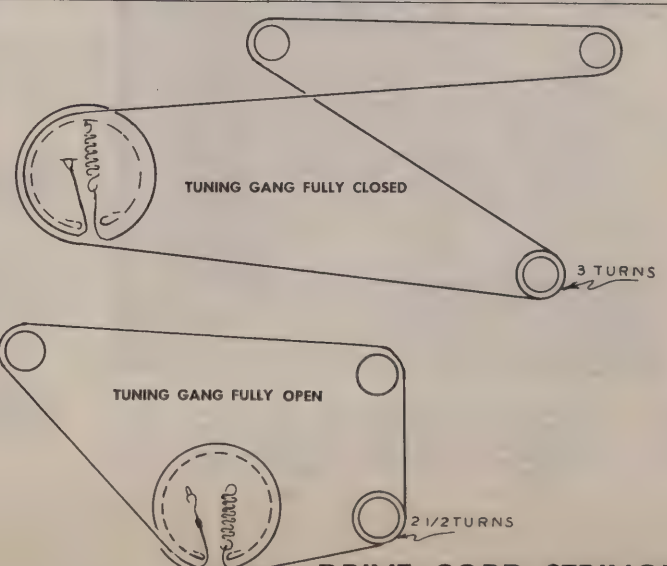
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	NATIONAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1A	Ant. Coil	30Ω	2.8Ω					Band "A", 540-1600KC
B	Ant. Coil	.9Ω	.8Ω	SB:1517				Band "B", 1.6-4.7MC
C	Ant. Coil	.9Ω	0Ω					Band "C", 4.7-14MC
L2	Ant. Coil	.1Ω	0Ω	SB:1519				Band "D", 14-40MC
L3A	RF Coil	30Ω	2.8Ω					Band "A"
B	RF Coil	.9Ω	.8Ω	SB:1518				Band "B"
C	RF Coil	.9Ω	.1Ω					Band "C"
L4	RF Coil	0Ω		SB:1520				Band "D"
L5	Osc.Coil	1Ω	1.5Ω	SB:1573-1	14-1060	BC-381	71-Osc.	Band "A"
L6	Osc. Coil	.8Ω	1.2Ω	SB:1574-1				Band "B"
L7	Osc. Coil	.1Ω	.1Ω	SB:1575-1				Band "C"
L8	Osc. Coil	.1Ω	0Ω	SB:1576-1				Band "D"
L9	1st.IF Trans.	20Ω	20Ω	Q242-2	16-5740	BC-339	912-C2	
L10	2nd.IF Trans.	20Ω	20Ω	Q242-2	16-5742	BC-339	912-C2	
L11	3rd.IF Trans.	18Ω		Q242-1	16-6770 *	BC-376	312-C6	Includes 47KΩ resistor and diode load filters
L12	BFO Coil	6Ω		SA:5361				Tapped ② 4.8Ω

* Cut out chassis metal strip, use adaptor plate and add 47KΩ resistor externally.

MISCELLANEOUS

ITEM No.	PART NAME	NATIONAL PART No.	NOTES
M1	Dial light	F136-11	# 47 bayonet
M2	Tuner	P705-2	General coverage (3 sections at 13-454MMF each)
M3	Tuner	P706-2	Bandspread (3 sections at 10-37MMF each)
M4	Switch	E230-2	Stand by-receive (toggle-SPST)
M5	Switch	S245-1	Band selector
M6	Switch	L209-2	(3) ANL-off, tone Hi-L), AM-CW (slide SPDT)
	Trimmer cap	S662-1	Antenna-air variable (5-50MMF)
	Trimmer cap	D832-5	RF-mica (4) used (2. 2-40MMF)
	Trimmer cap	E311-2	Osc-ceramic (2) used (5-20MMF)
	Trimmer cap	E311-1	Osc-ceramic (2) used (2. 5-6MMF)
	Knob	SA:5292-2	Large (3) used-antenna, main and band spread tuning
	Knob	SA:9305	Small (4) used-sensitivity, band select, pitch, volume



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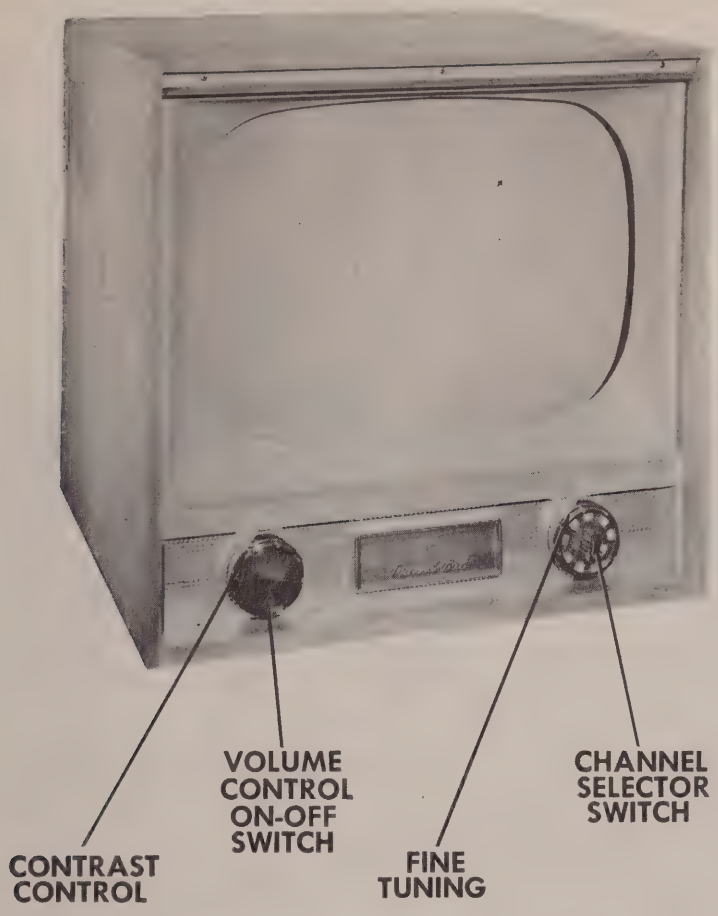

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PACKARD-BELL MODEL 2141

TRADE NAME	Packard-Bell Models 2041, 2042, 2043, 2044, 2141, 2142, 2143, 2144 (Ch. 2040)
MANUFACTURER	Packard-Bell Co. Service Div., 11th. & Hope Sts., Los Angeles 15, Calif.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 cycle RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75 MC, Sound IF 41.25 MC (Intercarrier)

INDEX

Alignment Instructions 6,7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Discriptions 14, 15, 16
Photographs
Cabinet - Rear View 11
Capacitor Identification 4, 9
Chassis - Top View 3
RF Tuner 10
Resistor Identification 19, 20
Photograph (Cont)
Trans., Inductor and Alignment Identification 17
Resistance Measurements 8
Servicing in the Field 18
Schematic (Alternate Tuner) 13
Schematic (TV) 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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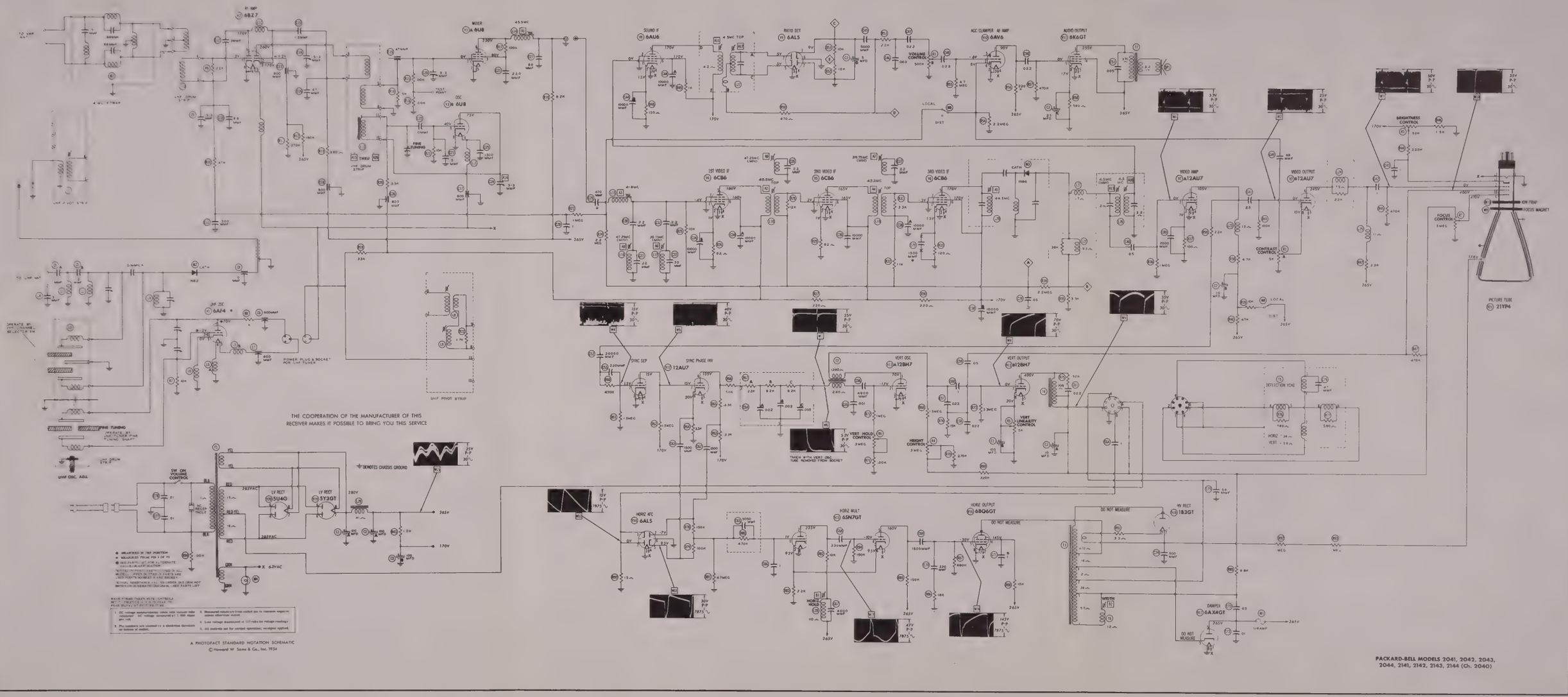
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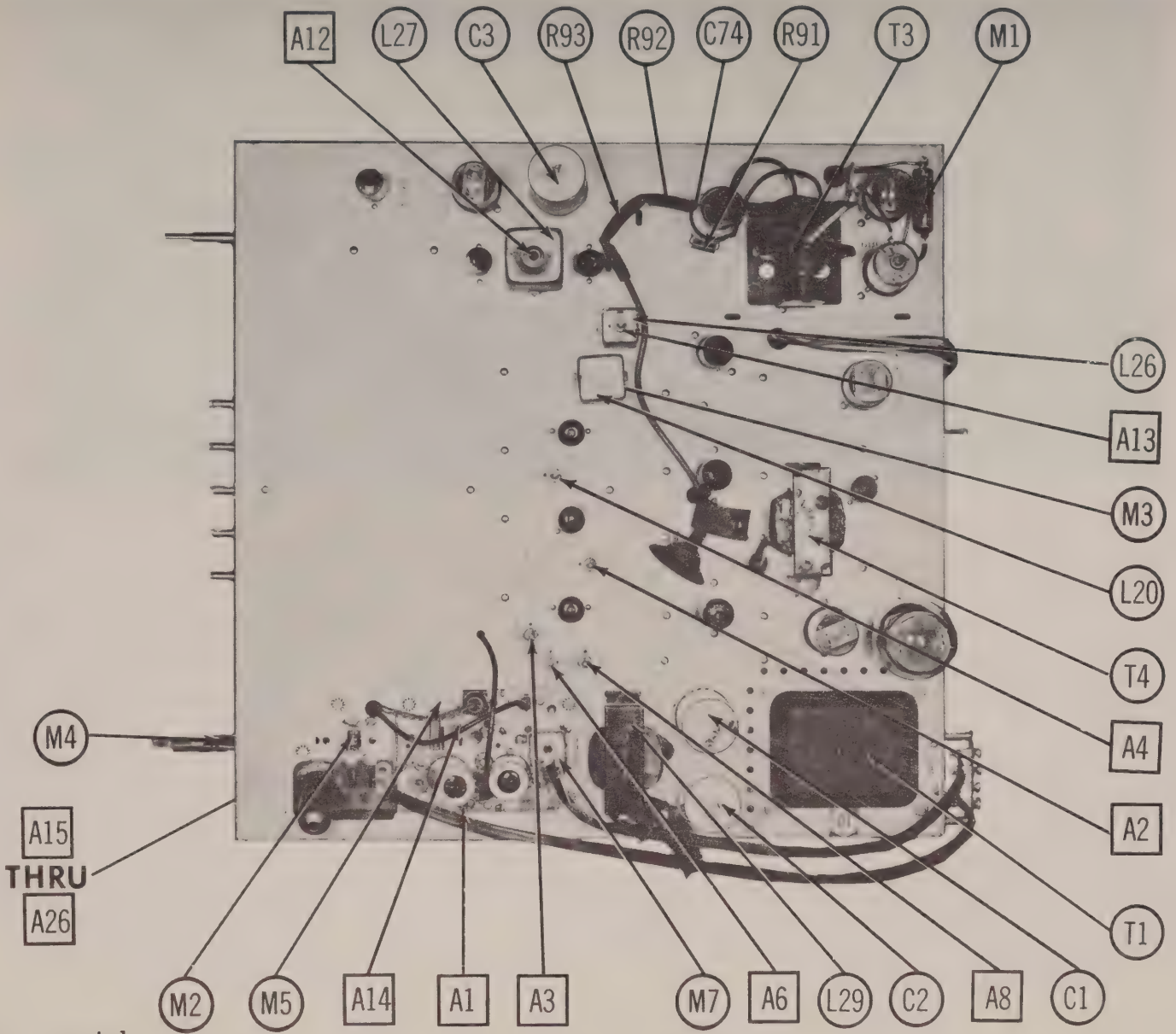

For tube location see tube placement chart page 5.

CHASSIS TOP VIEW

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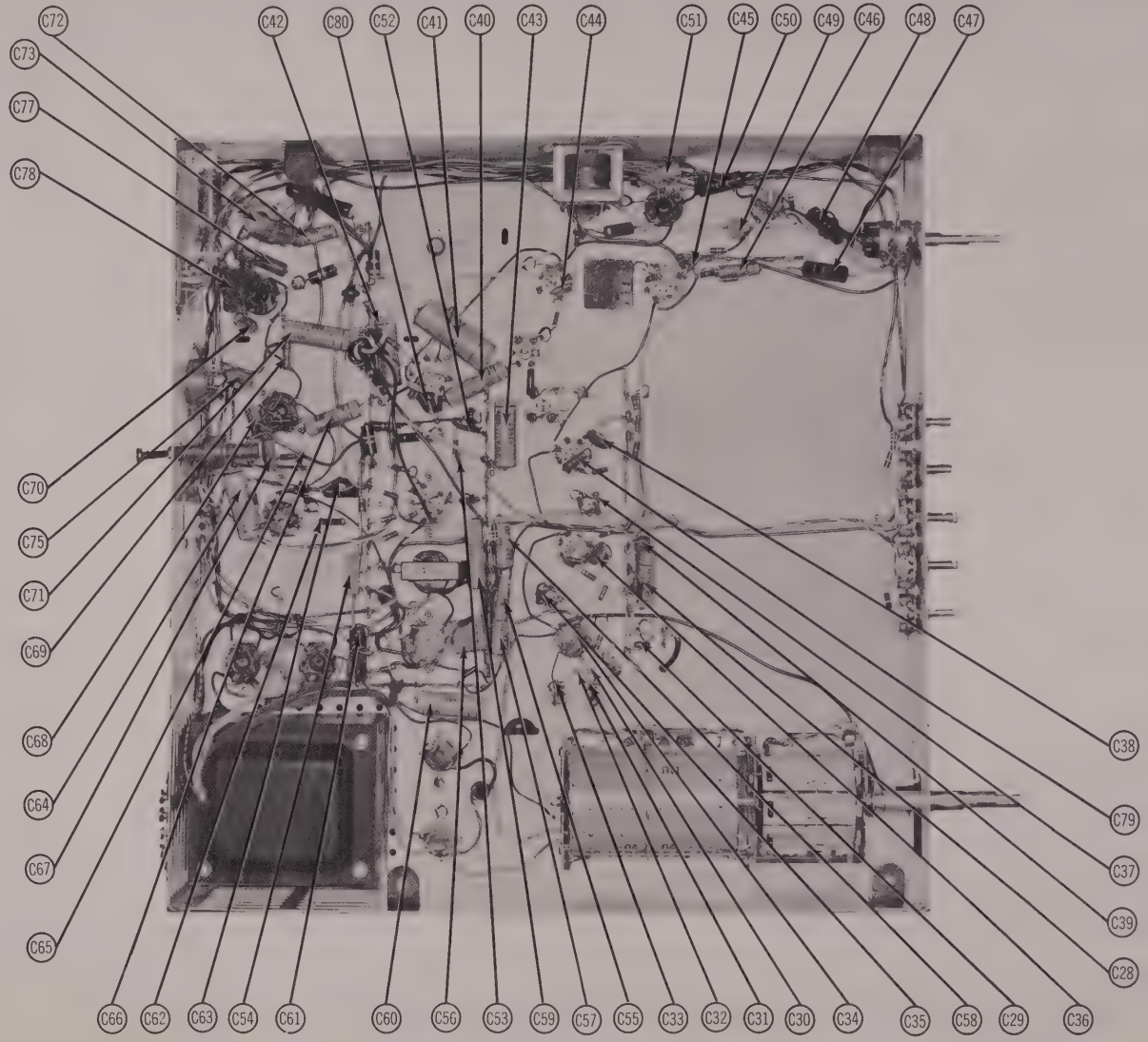

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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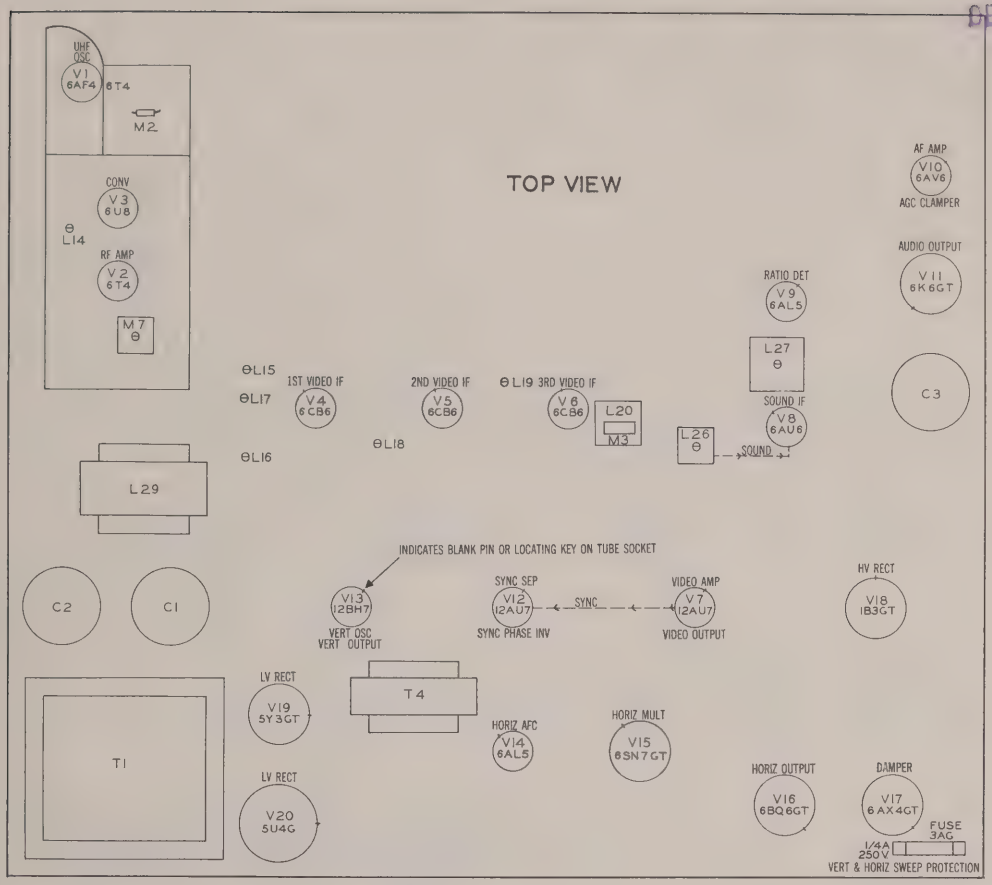
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V19, V20**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V21**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V10**

SYNC FAILURE
No vert. sync - **V12, V13**
No horiz. sync - **V12, V14, V15**
No vert. or horiz. sync - **V12**

SWEEP FAILURE
No raster, has sound - **V15, V16, V17, V18, V21 Fuse (M1)**
No vertical deflection - **V13**
Poor vert. linearity or foldover - **V13**
Poor horiz. linearity or foldover - **V15, V16, V17**
Narrow picture - **V15, V16, V17, V18, V19, V20**
Vert. off freq. - **V12, V13**
Horiz. off freq. - **V12, V14, V15**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis.	45.5MC (Unmod.)	3	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	"	"	"	A2	"
3.	"	"	41.8MC	"		A3	"
4.	"	"	43.3MC	"	"	A4	"
5.	"	"	44.5MC	"	"	A5	"
6.	"	"	39.75MC	"	"	A6, A7	Adjust for MINIMUM deflection.
7.	"	"	47.25MC	"	"	A8, A9	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 5MFD, 50 volt capacitor to point (A). Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Couple a second signal generator to ungrounded tube shield of converter tube (V3) to provide markers on response curve. Connect DC probe of VTVM to point (A). Common to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	39.75MC 41.25MC 43.3MC 45.0MC	3	Vert. Amp. thru 22KΩ to point (B). Low side to chassis.		Attenuate sweep generator to maintain 2 volts at point (A). Check for response similar to Fig. 1. If necessary SLIGHTLY retouch A1 thru A5 for desired response. To avoid possibility of smear on higher channels the 45.0MC marker MUST NOT EXCEED 97% response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (C). Common to chassis.	A10, A11	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (D). Common to point (E).	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. to point (C). Low side to chassis.	A10, A11	Disconnect stabilizer capacitor C3D. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
10.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A12	Reconnect stabilizer capacitor C3D. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 3. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

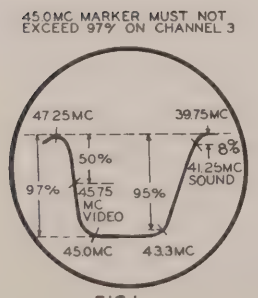


FIG.1

FIG.2

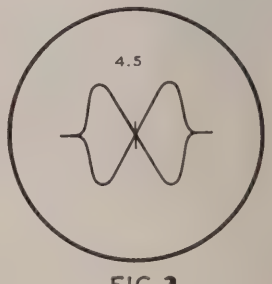


FIG.3

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ALIGNMENT INSTRUCTIONS (cont)

4.5MC TRAP ALIGNMENT

If a 4.5MC signal generator of crystal accuracy capable of at least one volt output is not available tune in a TV station and adjust A13 for MINIMUM 4.5MC beat interference.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru detector (Fig.4) to pin 2 (grid) of picture tube. Common to chassis.	A13	Set contrast control to maximum contrast position. Attenuate generator for at least one volt output. Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Restore tube shield on V3 to its proper position.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of channels it may be possible to correct them in one step using A14. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
If adjustment of A14 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.
The channel adjustment screws are reached through a hole above the channel switch shaft.
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the finet tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A15	Adjust to place sound marker as shown in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A16	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A18	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A19	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A20	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A21	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A22	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A23	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A24	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A25	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A26	

RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable.
Alignment of this portion of the receiver should not be required in the field.

UHF TUNER ALIGNMENT

Alignment of this protion of the receiver is not recommended in the field.

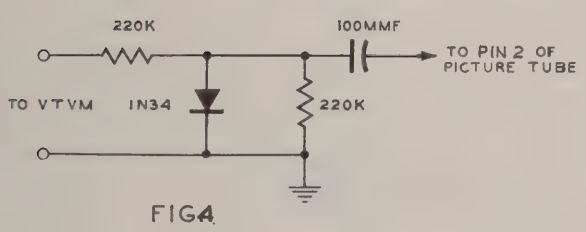


FIG4

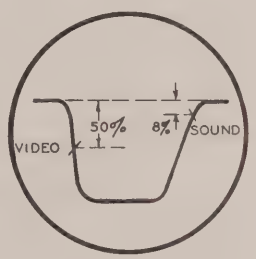


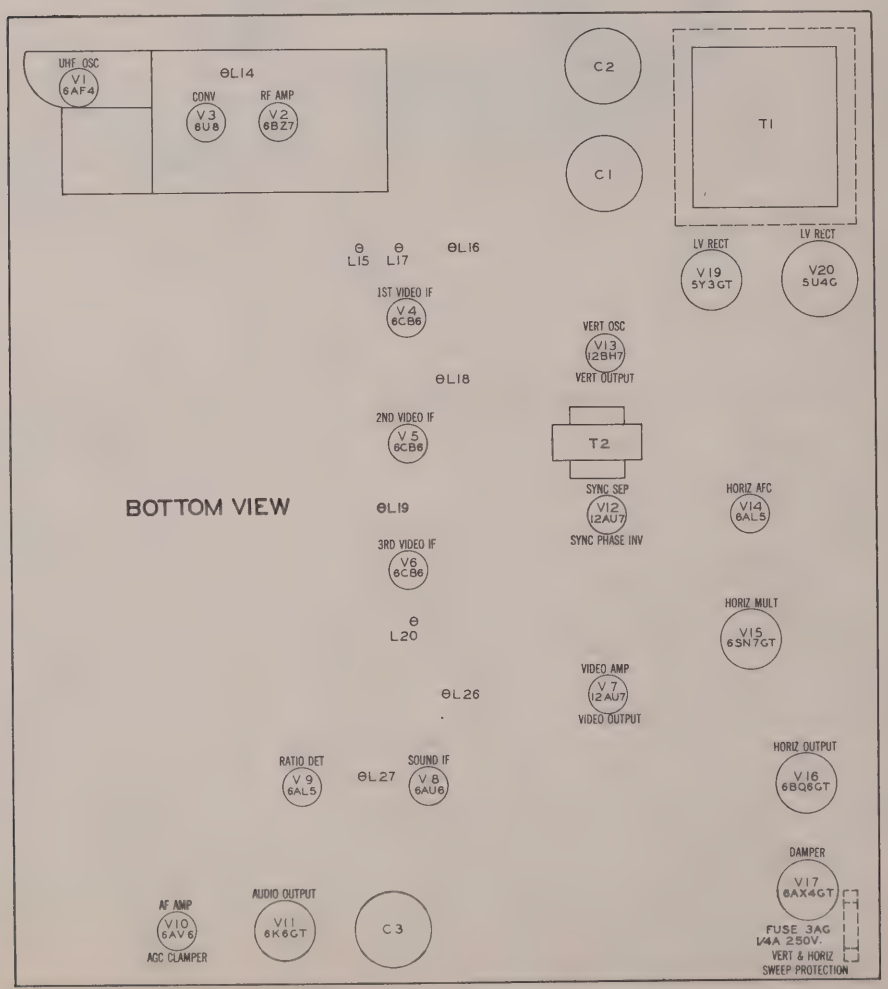
FIG.5

PACKARD-BELL MODELS 2041, 2042, 2043, 2044, 2141, 2142, 2143, 2144 (Ch. 2040)

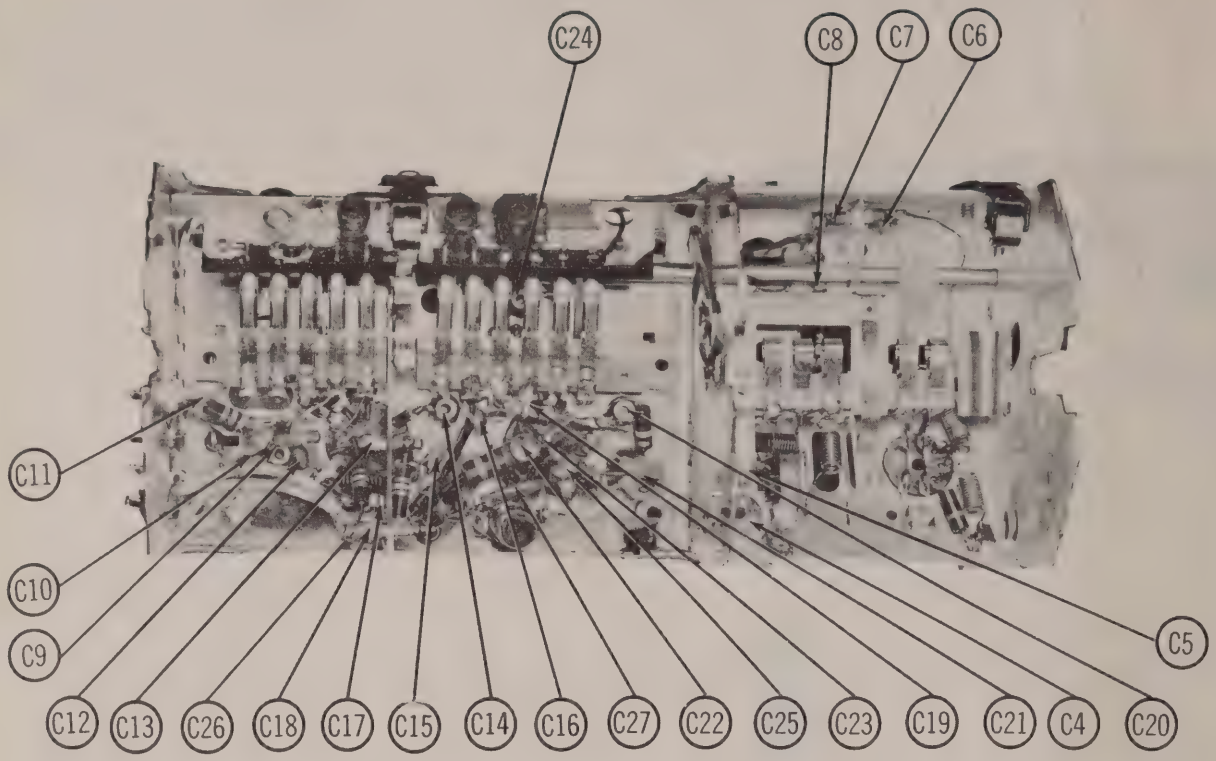
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■ 5. 5KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	†■ 5. 5KΩ		
V 2	6BZ7	† 720 Ω	† 100KΩ	INF	0Ω	.1Ω	INF	3. 2Meg	0Ω	0Ω
V 3	6U8	† 5KΩ	200KΩ	† 100KΩ	.1Ω	0Ω	† 8. 2KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	2. 2Meg	82Ω	0Ω	.1Ω	† 1. 7KΩ	† 1. 7KΩ	0Ω		
V 5	6CB6	2. 2Meg	82Ω	0Ω	.1Ω	† 1. 5KΩ	† 1. 5KΩ	0Ω		
V 6	6CB6	2. 2Meg	120Ω	0Ω	.1Ω	† 1. 3KΩ	† 1. 3KΩ	0Ω		
V 7	12AU7	† 15KΩ	1Meg	100Ω	.1Ω	.1Ω	† 3. 3KΩ	100KΩ	1. 8KΩ	0Ω
V 8	6AU6	3Ω	0Ω	0Ω	.1Ω	† 1. 2KΩ	† 2. 2KΩ	150Ω		
V 9	6AL5	20KΩ	0Ω	0Ω	.1Ω	INF	0Ω	INF		
V 10	6AV6	4. 7Meg	0Ω	0Ω	.1Ω	INF	2. 2Meg	† 220KΩ		
V 11	6K6GT	0Ω	0Ω	† 410Ω	† 40Ω	470KΩ	.5Ω	.1Ω	560Ω	
V 12	12AU7	† 1. 5Meg	1. 5Meg	0Ω	.1Ω	.1Ω	† 7KΩ	† 1. 5Meg	3. 3KΩ	0Ω
V 13	12BH7	♦ 3. 2Meg	2. 5Meg	0Ω	.1Ω	.1Ω	♦ 7KΩ	3. 3Meg	1. 5KΩ	0Ω
V 14	6AL5	15Ω	15Ω	0Ω	.1Ω	4. 8Meg	0Ω	4. 8Meg		
V 15	6SN7GT	5. 2Meg	† 10KΩ	2. 2KΩ	150KΩ	† 150KΩ	2. 2KΩ	.1Ω	0Ω	
V 16	6BQ6GT	INF	.1Ω	INF	† 10KΩ	680KΩ	18KΩ	0Ω	0Ω	TOP CAP ♦ 18Ω
V 17	6AX4GT	INF	INF	450KΩ	† 1. 2KΩ	† 45Ω	♦ 6. 8KΩ	.1Ω	0Ω	
V 18	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ♦ 490Ω
V 19	5Y3GT	INF	35KΩ	INF	16Ω	INF	15Ω	INF	35KΩ	
V 20	5U4G	INF	35KΩ	INF	16Ω	INF	15Ω	INF	35KΩ	
V 21	21YP4	0Ω	470KΩ	PIN 6 ♦ 7KΩ	PIN 10 ♦ 470KΩ	PIN 11 † 270KΩ	PIN 12 .1Ω			

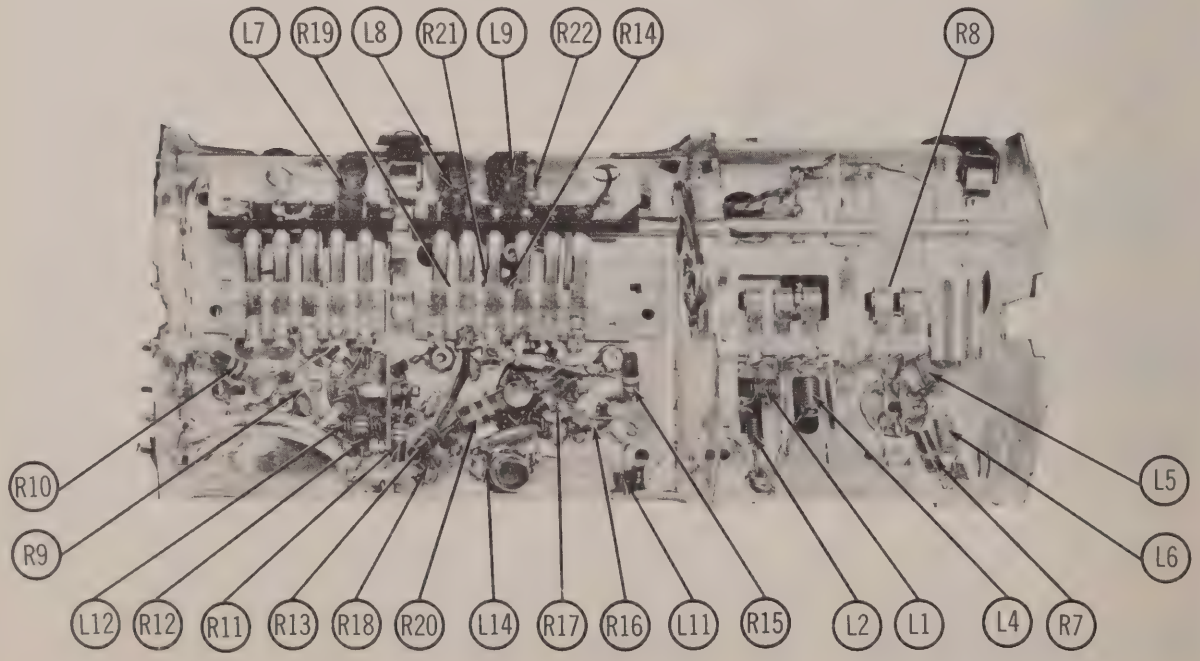
■ MEASURED IN UHF POSITION.
† MEASURED FROM PIN 2 OF V19.
♦ MEASURED FROM PIN 3 OF V12.



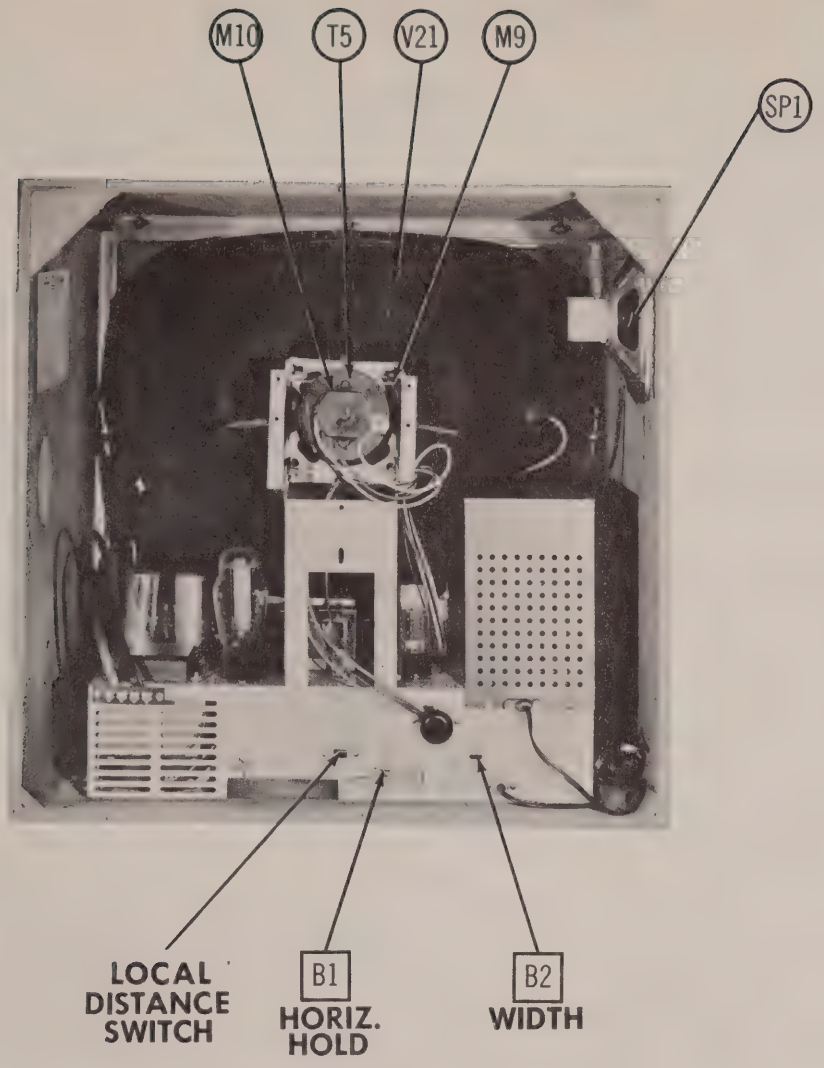
TUBE PLACEMENT CHART



UHF-VHF TUNER-BOTTOM VIEW



UHF-VHF TUNER-BOTTOM VIEW



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CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold control slug (B1). until the picture synchronizes horizontally.

Momentairly remove the signal by switching off channel and back again. If necessary, slightly retouch B1 for best lock-in action.

Adjust the horizontal width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V15, V16, V17, V19 and V20. Check adjustment B2. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check C71, C72, C73, R88, T3, T5A and other associated circuit components.	Check C68, C69, C70, R85, R87, and other associated components.

DRIVE LINES

Check by substitution V15, V16, and V17. Check C69, C70, R85, R87, C71, R88, T3, T5A, C72, C73 and other associated components for failure or change of value.

COMPRESSED LEFT SIDE

Check by substitution V15, V16 and V17. Check components associated with the horizontal output and damper stages especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V15, V16 and V17. Check C66 for open. Check T3, T5A, and T6. Check other associated circuit components.

XMAS TREE EFFECT

Substitute V15. Check C67, C68, L28 and other associated circuit components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Substitute V13. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R89 and other associated circuit components.	Check C60, R73, T2 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V13. Check T4, T5B, C1B and other associated circuit components.

COMPRESSED AT TOP

Substitute V13. Check C60, R73, C57, C58 and other associated circuit components.

FOLDS

Substitute V13. Check associated circuit components for failure or change of value.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Substitute V12. Check associated circuit components especially C52.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V12 and V13. Check waveform W6.

If Satisfactory	If Unsatisfactory
Check components associated with V13A.	Check vertical integrator network and other associated circuit components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Substitute V14 and V15. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check components associated with V15 especially C67 and C68.	Check C62, C63, R78, R79 and other associated components.

HORIZONTAL BENDING

Check by substitution V14, V15 and V16. Check horizontal AFC filter network components (C65, C66, R80, R81) for failure or change of value.

VIDEO

LOSS OF VIDEO

Substitute V7. Check picture tube and other associated circuit components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check video IF and sound take-off trap alignment.

POOR CONTRAST

Substitute V7. Check video detector crystal and assembly. Check picture tube and other associated circuit components.

NEGATIVE PIX

Substitute V7. Check AGC network for component failure. Check picture tube and other associated circuit components.

SMEAR

Substitute V7. Check L24, R38, R41, R42, R45, C41, C42, picture tube, video detector assembly and other associated circuit components for failure or change of value.

WIDE BLACK BAR ACROSS PIX

Check V2, V3, V4, V5, V6 and V7 for heater to cathode leakage. In case of UHF check V1.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9, V10 and V11. Check stages V10 and V11 using an audio signal generator. Apply signal across R55.

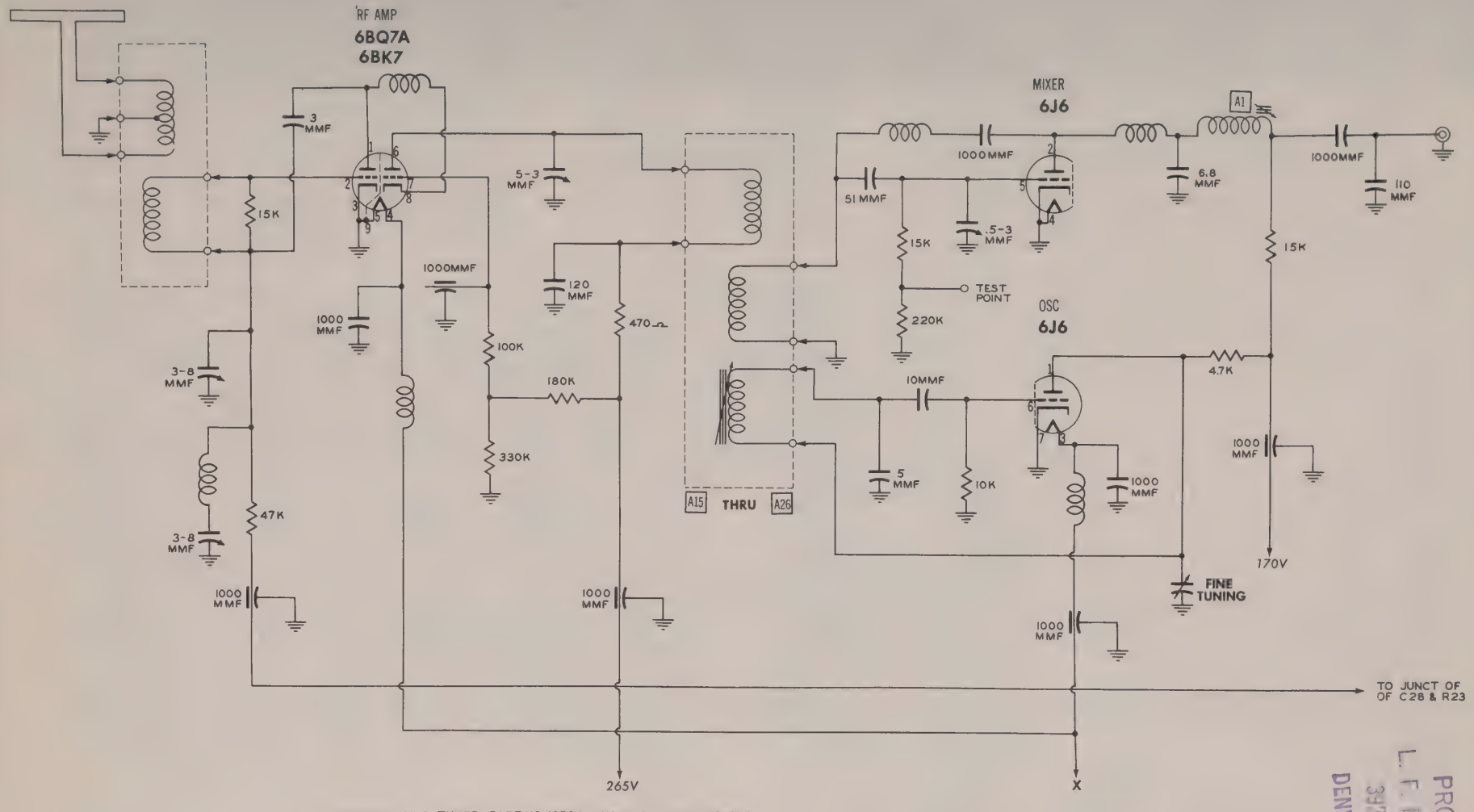
If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V10 and V11.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A12 for minimum buzz. If still objectionable, substitute V9 and realign audio IF and ratio detector stages.

DISTORTED

Follow procedure outlined under "Weak or No Sound".



ALTERNATE VHF TUNER PART NO. 10534 USED ON SOME MODELS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE TUNER SCHEMATIC

PACKARD-BELL
MODELS 2041, 2042, 2043, 2044, 2141, 2142, 2143, 2144 (Ch. 2040)

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1A	UHF Oscillator	6AF4	6AF4	7DK	} Tuner 10535
B	UHF Oscillator	6T4	6T4	7DK	
V2	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IFAmp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Amplifier-Video Output	12AU7	12AU7	9A	
V8	Sound IF Amp.	6AU8	6AU8	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AGC Clamper-AF Amp.	6AV8	6AV8	7BT	
V11	Audio Output	6K9GT	6K9GT	7S	
V12	Sync Separator-Sync Phase Inv.	12AU7	12AU7	9A	
V13	Vert. Oscillator-Vert. Output	12BH7	12BH7	9A	
V14	Horiz. AFC	6AL5	6AL5	6BT	
V15	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BQ6GT	6BQ6GT	8AM	
V17	Damper	6AX4GT	6AX4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5Y3GT	5Y3GT	5T	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Packard-Bell PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V21A	21YP4	21YP4	21YP4	21YP4	12L	① Circuit changes necessary
B	17HP4/17HP4	21AFP4 ① 17HP4/17RP4	17HP4/17RP4	12XP4A 17HP4/17RP4	12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±100	350	}	AFH3-183		C161		} FP229.3	TVL-3722	
B	±100	50						TC68		
C2A	±100	350	}	AFH-05		D004		FP450	TVL-3672	
B	±10	350								
C3A	±10	450	}	AFH4-110		D075		FP424.1	TVL-4706	
B	±100	350								
C	±25	25								
D	5	50								
C4	3									
C5A	1									
B	2									
C6	800			EF-001	MFT-1000				503C-D1	
C7	800			EF-001	MFT-1000				503C-D1	
C8	10									
C9	.5-3				829-3			CT565A		
C10	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5566	5TCCB-V68	
C11	1500			BPD-0015	DD-152	TM5D15	501-0015	DC-5215	5HK-D15	
C12	3			SI3NP0	TCZ-3		NP0K-030		5TCCB-V3	
C13	800			EF-001	MFT-1000				503C-D1	
C14	.5-3				829-3		CT565A			
C15	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C16	47			BPD-000047	DS-470		GP1K-470	UC-5447	5GA-Q47	
C17	800			EF-001	MFT-1000				503C-D1	
C18	800			EF-001	MFT-1000				503C-D1	
C19	47									
C20	.5-3				829-3		CT565A			
C21	220			BPD-00022	DS-221		GP2K-221	UC-5322	5GA-Y22	
C22	10			SI10NT50	TCN-10		NT50K-100	NT-541	5TCU-Q1	
C23	5			SI5NP0	TCZ-5		NP0K-050	ZT-555	5TCCB-V47	
C24	.5-3				829-3			CT565A		
C25	5000			BPD-0015	DD-152	TM5D15	501-0015	DC-5215	5HK-D15	
C26	800			EF-001	MFT-1000				503C-D1	
C27	56									
C28	.1	200		P288-1	DF-104	PI2P1		PT401	2TM-P1	
C29	470			SI470	DS-471		GP2K-471	UC-5347	5GA-T47	Note 1
C30	2.2			SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C31	22	500		1464-000025		SR5Q25		MCB220	MS-425	
C32	2.2			SI2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C33	30	500				5R5Q3			MS-43	
C34A	10000		}	BPD-2K01	DD3-103	TM5D81	81L-01	DCD-511	5HK-281	
B	10000						81L-01			
C35	22			SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C36	10000			BPD-01	DD-103	TM5B1	81L-01	DC-511	5HK-81	
C37	22			SI22N080			N080K-220			
C38A	10000		}	BPD-2K01	DD3-103	TM5D81	81L-01	DCD-511	5HK-281	
B	10000						81L-01			
C39	.05	200		P288-05	DF-503	PI2S5		PT415	2TM-S5	
C40	.05	600		P288-05	DF-503	PTE5S5		PT615	6TM-S5	
C41	.25	600		684-25		PTE5P25		PT6025	6TM-P25	
C42	.1	600		P688-1	DF-104	PTE5P1		PT601	6TM-P1	
C43	.1	600		P688-1	DF-104	PTE5P1		PT601	6TM-P1	
C44A	10000		}	BPD-2K01	DD3-103	TM5D81	81L-01	DCD-511	5HK-281	
B	10000						81L-01			
C45	5000			BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C46	.003	600		P688-003	D6-302	PTE5D3	GP2-333-302	PT623	6TM-D3	
C47	.022	600		P688-022	DF-203	PTE5S22		PT6122	6TM-S22	
C48	.022	600		P688-023	DF-203	PTE5S22		PT6122	6TM-S22	
C49	68			SI68	D5-680		GP1K-680	UC-5468	5GA-Q68	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C50	.022	600		P688-022	DF-203	PTE5S22		PT6122	6TM-S22	
C51	.005	600		P688-005	D5-502	PTE5D5	GP2-333-502	PT625	6TM-D5	
C52	20000			P688-03	DP-303	PTE5S3		PT613	6TM-S3	
C53	220			SI220	D5-221		GP3K-221	UC-5322	5GA-T22	
C54A	.002					} PTE5D2		} PT622		
B	.005			*PA-110	*PC-100	} PTE5D5	*1405-01	} PT625	*101C1	
C	.005					PTE5D5		PT625		
C55	.001	600		P688-001	D5-102	PTE5D1	GP2L-102	PT621	6TM-D1	
C56	4900	500		1464-005		IDR5D5		MCE465	M5-25	
C57	.022	600		P688-022		PTE5S22		PT6122	6TM-S22	
C58	.022	600		P688-022		PTE5S22		PT6122	6TM-S22	
C59	.05	600		P688-05	DF-503	PTE5S5		PT615	6TM-S5	
C60	.1	600		P688-1	DF-104	PTE5P1		PT601	6TM-P1	
C61	.022	600		P688-022		PTE5S22		PT6122	6TM-S22	
C62	1500			SI1500	D5-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C63	1500			SI1500	D5-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C64	.1	600		P688-1	DF-104	PTE5P1		PT601	6TM-P1	
C65	5000		†	†PA199	D5-502	PTE5D5	GP2-333-502	PT625	6TM-D5	
C66	.1	200		P286-1	DF-104	PI2P1		PT401	2TM-P1	
C67	4000	500		1464-004		IDR5D4		MCB463	M5-24	
C68	330	500								
C69	1500			SI1500	D5-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C70	330									
C71	.1	600		P688-1	DF-104	PTE5P1		PT601	6TM-P1	Note 2
C72	.01	600		P688-01	D5-103	PTE5S1	GP2-333-103	PT611	6TM-S1	
C73	.05	600		P688-05		PTE5S5		PT615	6TM-S5	
C74	500	20000		HV30C	TV3-502	MMC-3075	413-501	HV3003SA	20DK-T5	
C75	56	3500							75GA-Q56	
C76	47									
C77	.01	125VAC								
C78	.01	125VAC								
C79	1500			SI1500	D5-152	TM5D15	GP2L-152	UC-5215	5GA-D15	Note 3
C80	2000			BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	

Note 1. Used with tuner 10535 only.
Note 2. Some Models use .05MFD in this application.
Note 3. Not used in all Models.
* Items C54A, C54B, C54C, R67A, R67B, R67C are combined in one unit.
† Items C65 and R80 are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω	½	25835A	* QJ-36	RTV-212	SBB-527-S	UF53R	Contrast Panel
B	500KΩ	½	Not Req.				UR55A †	Volume Rear
C	Switch	½	Not Req.				US-36	Attach to R1B
R2A	3Meg	½	25854	QU-140	AG-84-8	AB-34	U-59	Focus
B	Shaft		Not Req.	Not Req.	KBS-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ	½	25856	QU-123	AG-44-8	AB-31	U-35	Brightness
B	Shaft		Not Req.	Not Req.	KBS-3	AK-4	Not Req.	Attach to R3A
R4A	3Meg	½	25854	QU-140	AG-84-8	AB-34	U-59	Height
B	Shaft		Not Req.	Not Req.	KBS-3	AK-4	Not Req.	Attach to R4A
R5A	5000Ω	½	25853	QU-114	AG-19-8	AB-10	U-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	KBS-3	AK-4	Not Req.	Attach to R5A
R6A	3Meg	½	25854	QU-140	AG-84-8	AB-34	U-59	Vert. Hold
B	Shaft		Not Req.	Not Req.	KBS-3	AK-4	Not Req.	Attach to R6A

† Universal replacement (Mallory exact duplicate Part. No. UE52S8)
* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B17-114 & P1-112 (Panel) B13-133 & M2-204 (R2ar) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No.	NOTES
R7	10KΩ	½		BTS-10K	
R8	1000Ω	½		BTS-1000	
R9	22KΩ	½		BTS-22K	
R10	47KΩ	½		BTS-47K	
R11	270KΩ	½		BTS-270K	
R12	180KΩ	½		BTS-180K	
R13	680Ω	½		BTS-680	
R14	15KΩ	½		BTS-15K	
R15	100KΩ	½		BTS-100K	
R16	100KΩ	½		BTS-100K	
R17	100KΩ	½		BTS-100K	
R18	8200Ω	½		BTS-8200	
R19	33KΩ	½		BTS-33K	
R20	3300Ω	1		BTA-3300	
R21	10KΩ	½		BTS-10K	
R22	4700Ω	½		BTS-4700	
R23	1Meg	½		BTS-1Meg	
R24	2. 2Meg	½		BTS-2. 2Meg	
R25	10KΩ	½		BTS-10K	
R26	82Ω	½		BTS-82	
R27	220Ω	½		BTS-220	
R28	12KΩ	½		BTS-12K	
R29	82Ω	½		BTS-82	
R30	220Ω	½		BTS-220	
R31	3300Ω	½		BTS-3300	
R32	1000Ω	½		BTS-1000	
R33	120Ω	½		BTS-120	
R34	2. 2Meg	½		BTS-2. 2Meg	
R35	3300Ω	½		BTS- 3300	
R36	1Meg	½		BTS-1Meg	
R37	100Ω	½		BTS-100	
R38	4700Ω	1		BTA-4700	
R39	10KΩ	2		BTB-10K	
R40	47KΩ	1		BTA-47K	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No.	NOTES
R41	100KΩ	½		BTS-100K	
R42	3300Ω	2		BTB-3300	
R43	1200Ω	12		2D-1200	
R44	220KΩ	½		BTS-220K	
R45	470KΩ	½		BTS-470K	
R46	1500Ω	½		BTS-1500	
R47	470KΩ	½		BTS-470K	
R48	150Ω	½		BTS-150	
R49	1000Ω	½		BTS-1000	
R50	470Ω	½		BTS-470	
R51	10KΩ	½		BTS-10K	
R52	10KΩ	½		BTS-10K	
R53	22KΩ	½		BTS-22K	
R54	2. 2Meg	½		BTS-2. 2Meg	
R55	4. 7Meg	½		BTS-4. 7Meg	
R56	220KΩ	½		BTS-220K	
R57	470KΩ	½		BTS-470K	
R58	560Ω	2		BTB-560	
R59	22KΩ	½		BTS-22K	
R60	470KΩ	½		BTS-470K	
R61	1. 5Meg	½		BTS-1. 5Meg	
R62	1. 5Meg	½		BTS-1. 5Meg	
R63	3300Ω	½		BTS-3300	
R64	3300Ω	½		BTS-3300	
R65	3300Ω	½		BTS-3300	
R66	56KΩ	½		BTS-56K	
R67A	22KΩ	½		BTS-22K	
B	8200Ω	½		BTS-8200	
C	8200Ω	½		BTS-8200	
R68	1. 5Meg	½		BTS-1. 5Meg	
R69	220KΩ	½		BTS-220K	
R70	270KΩ	½		BTS-270K	
R71	100KΩ	½		BTS-100K	
R72	1Meg	½		BTS-1Meg	

RESISTORS (cont)

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No.	NOTES
R73	3. 3Meg	½		BTS- 3. 3Meg	
R74	15KΩ	½		BTS-15K	
R75	150KΩ	½		BTS-150K	
R76	560Ω	½		BTS-560	
R77	560Ω	½		BTS-560	
R78	100KΩ	½		BTS-100K	
R79	100KΩ	½		BTS-100K	
R80	470KΩ	½	†	BTS-470K	
R81	4. 7Meg	½		MCE465	M5-25
R82	10KΩ	½		BTS-10K	
R83	2200Ω	½		BTS-2200	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No.	NOTES
R84	150KΩ	½		BTS-150K	
R85	150KΩ	½		BTS-150K	
R86	18KΩ	½		BTS-18K	
R87	680KΩ	½		BTS-680K	
R88	10KΩ	2		BTB-10K	
R89	6800Ω	5		1 3/4A-7000	
R90	15Ω	½			
R91	3. 3Ω	1			
R92	1Meg	1		BTA-1Meg	
R93	1Meg	1		BTA-1Meg	
R94	100KΩ	½		BTS-100K	

† Items R80, . C65 are combined in one unit.
* Items R67A, 67B, 67C, C54A, C54B, C54C are combined in one unit

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: Packard-Bell PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No	RCA TYPE No.
T1	117VAC ②1.8A	540VCT .280ADC	5VAC ⑤ 6A	6.3VAC ⑤8.4A	89045			P9739Ⓒ ②	R-61BC ②	

① Drill new mounting holes.
② Parallel 6.3 volt windings, and use as Sec. 3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.
T2	Vert. Osc. Trans.	89046	A-8125	A-303	A-97X	259T1②	B6702
T3	Horiz. Output Trans.	89440	A-8127	HVO-9 ②	D-19 ②	235T1 ①	FB41l ①
T4	Vert.Output Trans.	89441	A-8140③ ④	A-3081 ①	A-103X ④		Z1805 ③④
T5A	Yoke - Horiz. (38.6MH)	29556					
B	Yoke -Vert. (3.5MH)						
T6	Width Coil (4-16MH)	29555B		MWC-12 ① ⑦ ⑧	WC-12 ① ⑧	21ZR1 ①	

① Connect original terminal #7 to new terminal #9, original #4 to new #8, original "T" to new #7, original #3 to new #3, original #1 to new #1.
② Connect terminal #6 to terminal #7, then connect original terminal #7 to new terminal #9, original #4 to new #8 and #7, original #"T" to new #5, original #3 to new #3, original #1 to new #1.
③ Drill new mounting holes.
④ Connect as autotransformer.
⑤ Use 50-1 turns ratio.
⑥ Connect to coded blue and red terminals.
⑦ Enlarge mounting hole.
⑧ Bend clip or use original slider and core.
⑨ Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Packard-Bell PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No	NOTES
T7	6. 3KΩ	3. 3Ω	370Ω	. 53Ω		A-3878	A-2931	Z1113	S-7X	

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: Packard-Bell PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3. 3Ω	83305	ST-108 Mod P6-X	6A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	RF Choke	0Ω						
L2	RF Choke	0Ω						
L3	UHF Ant. Mixer & Osc. Coils	0Ω						
L4	RF Choke	0Ω						
L5A	FIL Choke	0Ω						
B	FIL Choke	0Ω						
L6	Cathode Choke	0Ω						
L7	UHF IF Trans.	0Ω	.3Ω					
L8	UHF IF Trans.	.3Ω	.3Ω					
L9	UHF IF Coil	.2Ω						
L10	VHF Ant.Coil	00CT	0Ω					
L11	FIL Choke	0Ω						
L12	Neutr. Coil	0Ω						
L13	VHF RF, Mixer Grid & Osc. Coils	0Ω						
L14	Conv. Plate	.1Ω						
L15	1st Video IF	.1Ω		29559	20-1045 *		6219 *	
L16	47.25MC Trap	0Ω		29565	17-4523 *		6219 *	
L17	39.75MC Trap	0Ω		29564	20-1046 *			
L18	2nd Video IF	.1Ω	.1Ω	29560				Includes trap
L19	3rd Video IF	.1Ω	.1Ω	29574				Includes trap
L20	4th Video IF	0Ω	0Ω	29573				Includes crystal detector & capacitors.

PROPERTY OF L[illegible] SHIP [illegible] Detroit, Michigan

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: MILLER PART No.	NOTES
L21	Series Peak. Coil	1.7Ω					4612	11.2 Microhenries
L22	Shunt. Peak. Coil	9.5Ω			19-4180	TV-183	6179	180 Microhenries; wound on 39KΩ resistor
L23	Shunt. Peak. Coil	15Ω			19-3300		4648	400 Microhenries
L24	Series Peak. Coil	7.5Ω			19-3125 †	TV-182	6178	120 Microhenries; wound on 22KΩ resistor
L25	Shunt. Peak. Coil	11Ω			19-3250	TV-185	6181	270 Microhenries
L26	Sound IF	2Ω	3.2Ω	29563	17-1021	TV-108 ■	1466 ■	
L27	Ratio Det.	4.2Ω	.3ΩCT	29054	17-3493	TV-115 ▲	6205 ▲	Tertiary winding= .75Ω
L28	Horiz. Osc.	110Ω		29527	19-1576	TV-163	6210	

* Use one winding only.
† Parallel with 22KΩ resistor.
■ Drill one new mounting hole.
▲ Use adaptor plate.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: Halldorson PART No.	REPLACEMENT DATA: TRIAD PART No.
L29	.280ADC	41Ω	1.6 Hy.	27005	C-2326 ①	C-2996	C5037 ①	C-17X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: Packard-Bell PART No. FUSE	Packard-Bell PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1/4A 250V			312.250 (3AG-1/4A)	357001	AGC 1/4	4405

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: SYLVANIA PART No.		NOTES
M2	1N82		1N82 or 1N82A		UHF Mixer
M3	1N64		1N132		Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M4	Dial Light		#47 Bayonet
M5	Tuner	10535	UHF-VHF Combination
M6	Tuner	10534	VHF
M7	Trap		41MC IF Trap (VHF antenna)
M8	Switch		Local-Distance (DPDT slide)
M9	Focus Magnet		(28073)
M10	Ion Trap		(28106)

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
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3924 MEADE ST
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, substitute V19 and V20. Check B+ filter and decoupling network components.

SMALL AND/OR DIM PIX

Substitute V19 and V20. Check B+ filter and decoupling components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V15, V16 V17 and V18. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check R91, R92, R93, C74, T3, T5A, C71, R88 and other associated circuit components.	Check C68, C69, R85, R87, and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V15, V16, V17, V18, V19, and V20. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by sbustitution V15, V16, V17, V18, V19 and V20. Check R91, R92, R93, C74, T3, T5A, C71, R88 and other associated components.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER PIX NO SOUND

Follow procedure outlined under "Weak or No Sound."

RASTER NO SOUND NO PIX

Check V2, V3, V4, V5 and V6 by substitution. Check video detector assembly. Check components associated with the video IF strip. In case of UHF check V1.

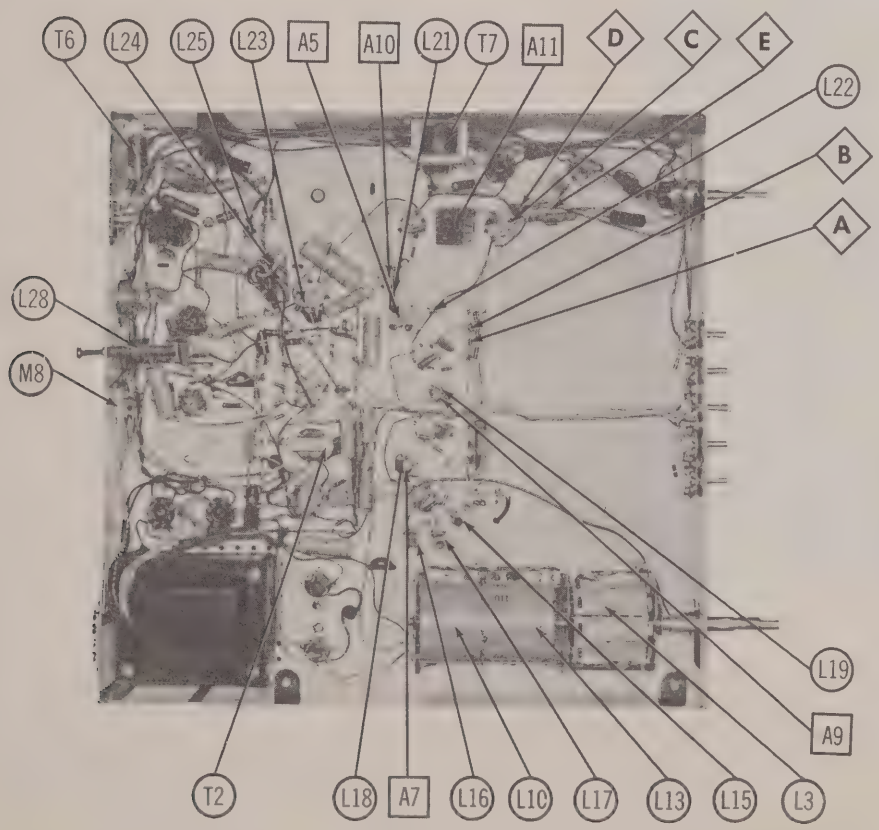
NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft. Use a long alignment tool to adjust.

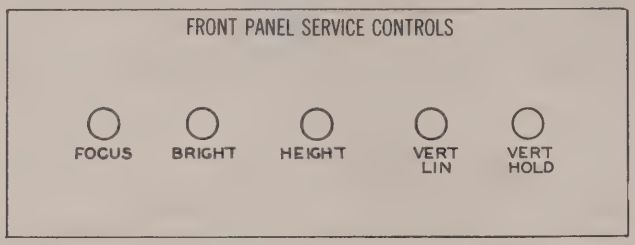
PICTURE TUBE SAFETY GLASS CLEANING

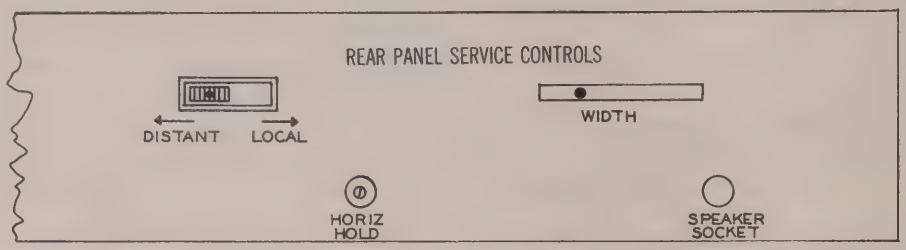
To clean safety glass remove three wood screws holding wood strip at the top of the safety glass. Remove wood strip and safety glass. (Use extreme caution when removing safety glass).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of chassis. Adjust the horizontal hold slug L28 until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L27 located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for horizontal Sweep protection. (For location, see tube palcement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located next to the yoke . Turn the lever and at the same time rotate the ring around the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

Remove 5 push on type control knobs from front panel.

Remove 8 wood screws . Remove rear cover.

Disconnect speaker plug.

Remove 4 chassis bolts. Remove chassis.

Remove 4 speaker nuts. Remove speaker.

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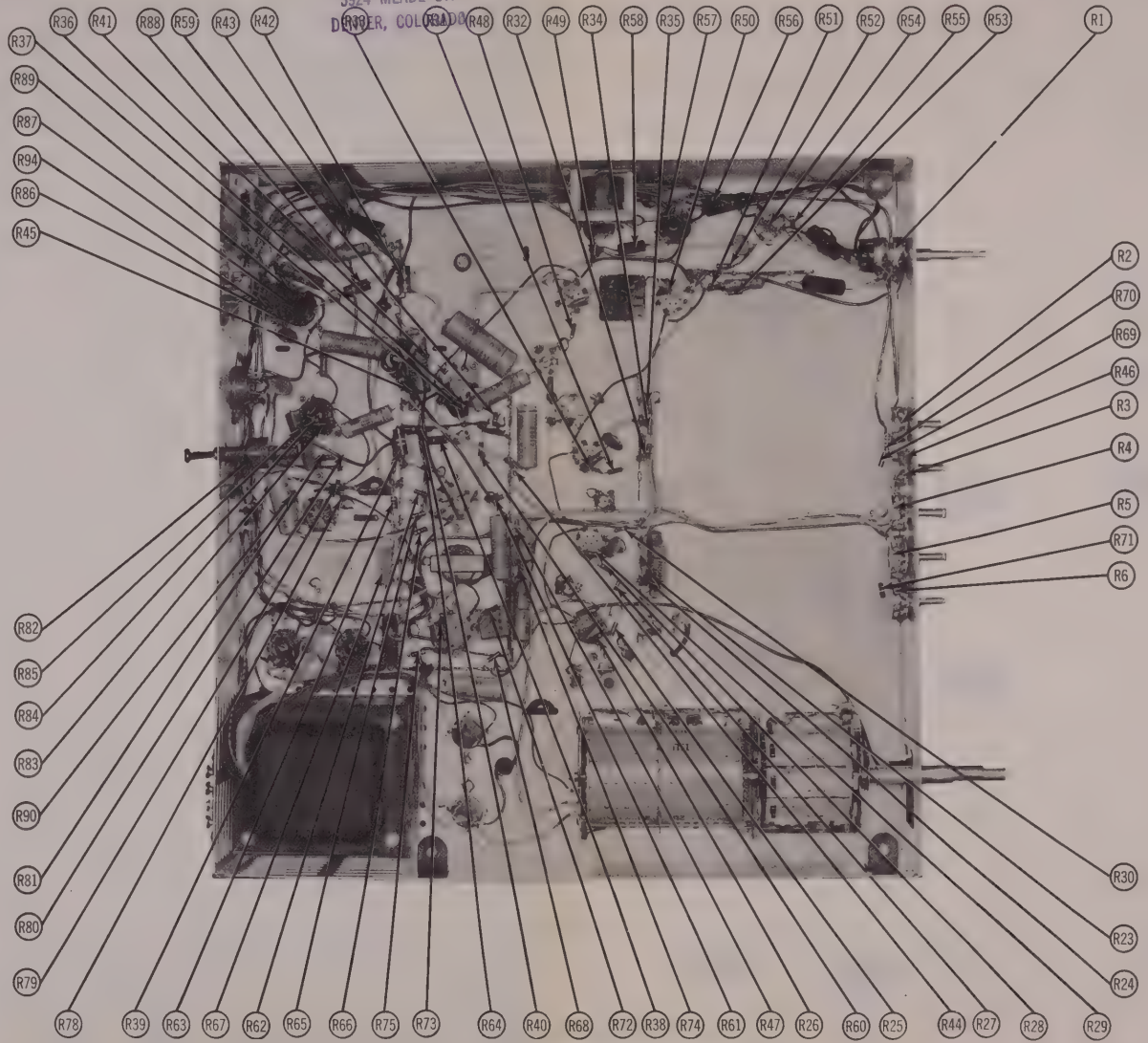

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
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DENVER, COLORADO

ROLAND
MODEL 5P4

ROLAND
MODEL 5P4

TRADE NAME	Roland Model 5P4
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7½ Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	.12 Amp. @ 117 Volts AC (or) 50MA @ 7½ Volts DC & 18MA @ 90 Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

ROLAND MODEL 5P4

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ROLAND PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/40-40		BBRT4415		3N529	TVA-3433	Red
B	40	150		PRS250/25		X25				Green
C	200	25								Yellow
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C4	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C7	.002	400		P488-002	D6-202	CUB4D2	GP2L-202	PT422	4TM-D2	
C8	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-D1	
C9	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C10	.002	400		P488-002	D6-202	CUB4D2	GP2L-202	PT422	4TM-D2	
C11	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C12	.05	200		P288-05		PJ2S5		PT415	2TM-S5	
C13	.2	200		P288-2		PJ2P2		PT402	2TM-P2	
C14	.05	400		489ZX-05		PJ4S5		PT415	4TM-S5	
C15	.2	400		P488-2		PJ4P2		PT402	4TM-P2	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	VC-53	Q13-137	AG-63-Z	BSK-70-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

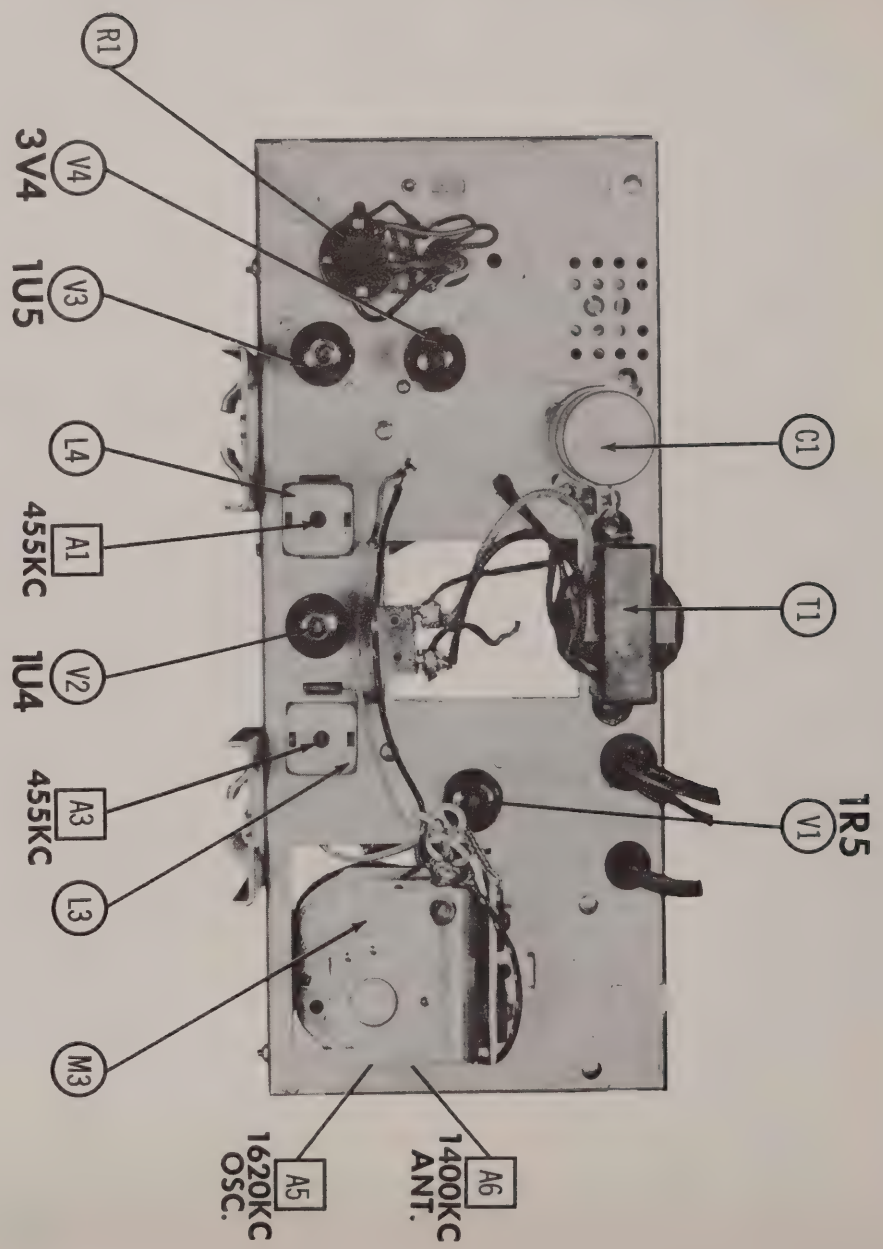
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ROLAND PART No.	IRC PART No.	NOTES
R2	100KΩ	½		BTS-100K	
R3	3.3Meg	½		BTS-3.3Meg	
R4	8200Ω	½		BTS-8200	
R5	2.2Meg	½		BTS-2.2Meg	
R6	10Meg	½		BTS-10Meg	
R7	4.7Meg	½		BTS-4.7Meg	
R8	220KΩ	½		BTS-220K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ROLAND PART No.	IRC PART No.	NOTES
R9	1Meg	½		BTS-1Meg	
R10	47Ω	1			
R11	2300Ω	7	K-12J47-18		
R12	2700Ω	1		BTA-2700	
R13	1000Ω	½		BTS-1000	
R14	1000Ω	½		BTS-1000	
R15	1500Ω	½		BTS-1500	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ROLAND PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	NOTES
T1	9.7KΩ	3.3Ω	496Ω	.73Ω		A-3879	A-2932	Z1116	S-11X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω		ST-113 Mod. P4-X	4A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ROLAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	1.3Ω						
L2	Osc. Coil	.5Ω	3Ω		14-1074		70-Osc.	
L3	Input IF	19Ω	19Ω	LF-24	16-6758	BC-352	12-C1	
L4	Output IF	19Ω	19Ω	LF-24	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

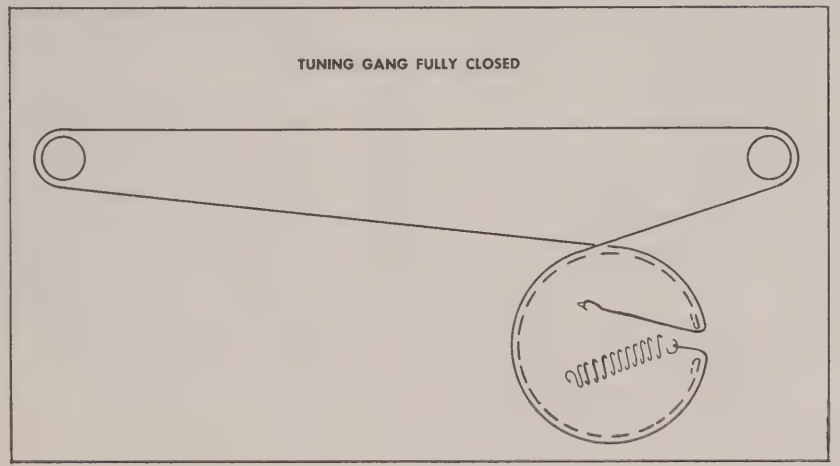
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	ROLAND PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.060A		8J1	1002A	6S65	65	

BATTERIES

ITEM No.	VOLTAGE	ROLAND PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5V "A" 90V "B"				756			T6Z60	

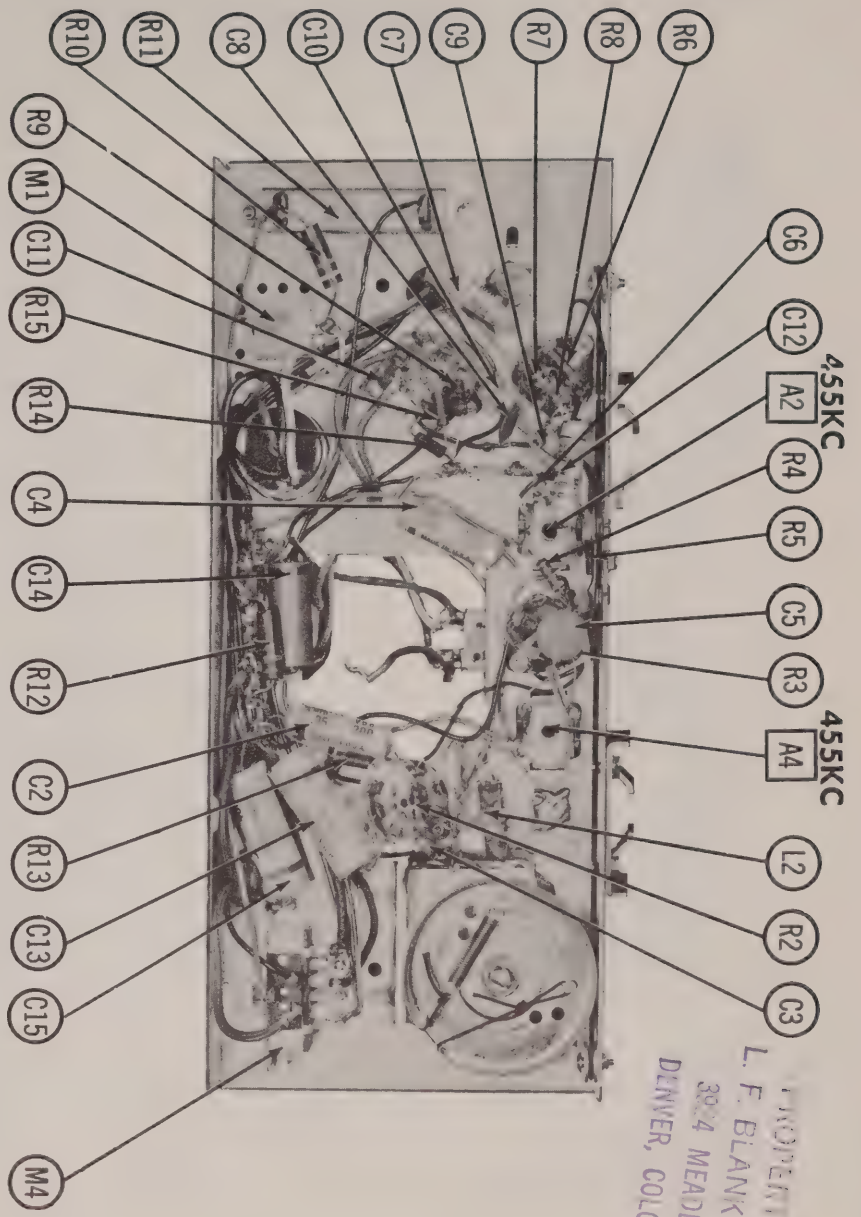
MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M3	Tuning cap	CV-28	2 section (36-452MMF, 31-195MMF)
M4	Switch		Power changeover



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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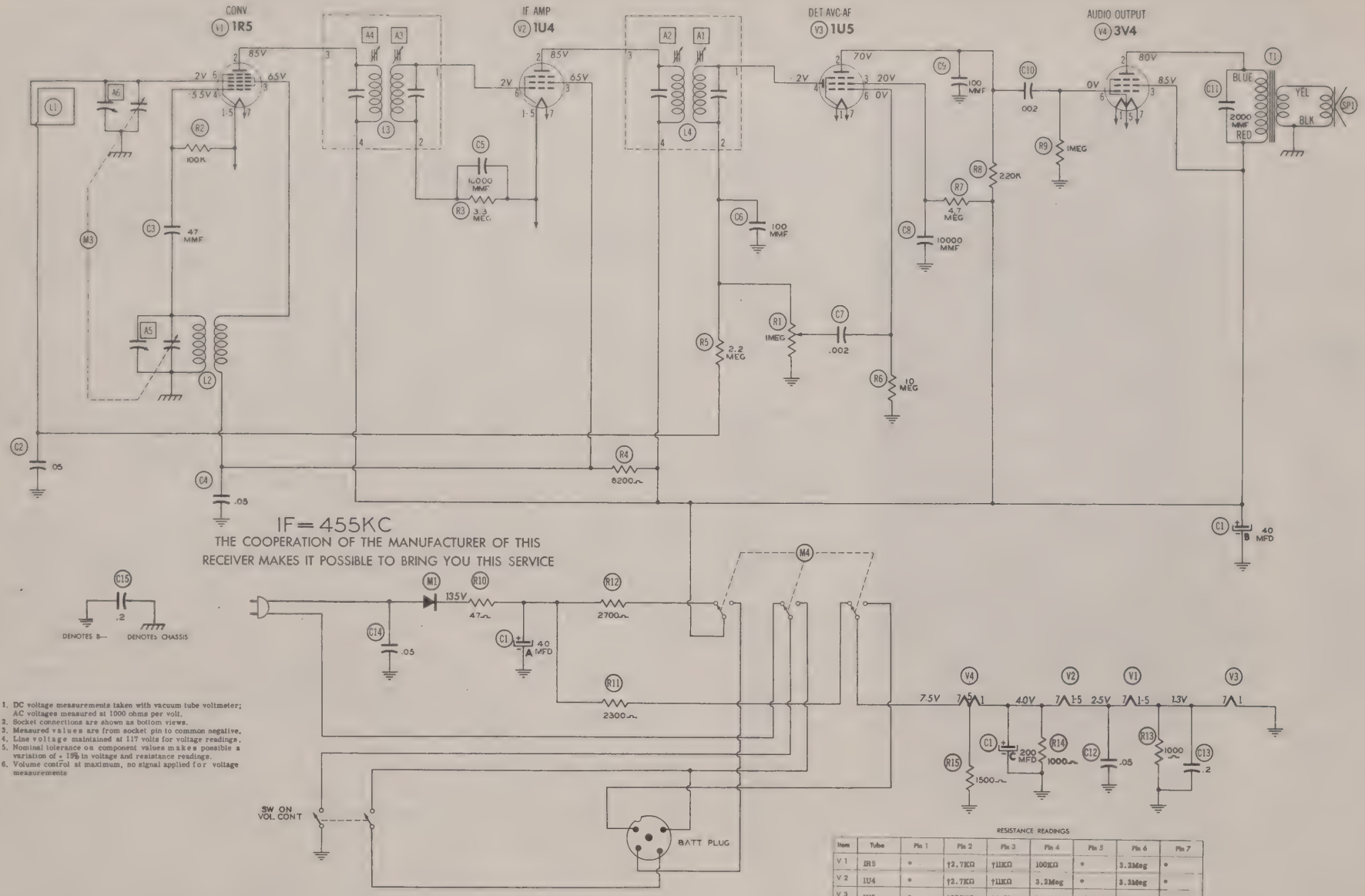
DENVER, COLORADO

ROLAND MODEL 5P4


CONV
V1 1R5
IF AMP
V2 1U4
DET AVC-AF
V3 1U5
AUDIO OUTPUT
V4 3V4
IF = 455KC
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES B+
DENOTES CHASSIS
SW ON VOL CONT
BATT PLUG
BLUE
YEL
BLK
RED
2000 MMF
40 MFD
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.7KΩ	†11KΩ	100KΩ	*	3.2Meg	*
V 2	1U4	*	†2.7KΩ	†11KΩ	3.2Meg	*	3.3Meg	*
V 3	1U5	*	†220KΩ	†4.7Meg	1Meg	†2.7KΩ	10Meg	*
V 4	3V4	*	†3.3KΩ	†2.7KΩ	INF	*	1Meg	*

† MEASURED FROM OUTPUT OF M1
* DO NOT USED OHMMETER TO MEASURED FILAMENT RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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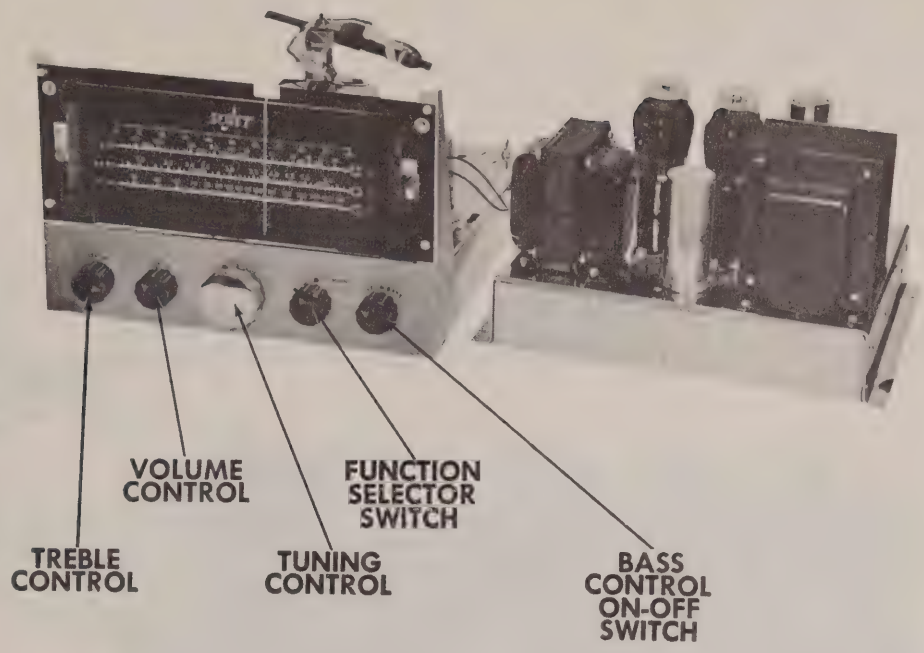

SCOTT
MODEL 2510

SCOTT
MODEL 2510

TRADE NAME	Scott Model 2510
MANUFACTURER	Scott Radio Labs., Inc., 1020 N. Rush St., Chicago 11, Ill.
TYPE SET	AC Operated 3 Band Radio-Phono Combination Superheterodyne Receiver
TUBES (Twelve)	Types 6BA6 RF Amp., 6C4 Mixer, 6C4 Osc., (2) 6BA6 IF Amp., 6SQ7 Det.-AVC-AF Amp., 6SN7GT AF Amp., 6SN7GT AF Amp.-Phase Inv., (2) 6L6GT Audio Output, 5U4G Rectifier
POWER SUPPLY	105, 125, 150, 210, 250 Volts AC-50/60 Cycles — RATING 1.6 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535 - 1650KC — SHORT WAVE 2-6MC, 6-20MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated screwdriver for adjusting.
Turn bass and treble controls fully clockwise.
An 8Ω, 10 watt resistor may be used in place of speaker voice coil during alignment.
With tuning gang fully closed set dial pointer to "0" on the "log" scale.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (grid) of 6C4 (V2). Low side to chassis.	455KC (400~Mod)	Band 1	1600KC	Across voice coil	A1, A2, A3, A4, A5, A6	Attenuate signal generator to maintain 2 volts AC at output meter. Adjust for maximum deflection.
2.	"	High side to antenna terminal #1. Low side to chassis.	1000KC	"	1000KC	"	A7	"
3.	"	"	600KC	"	600KC	"	A8	"
4.	"	"	"	"	"	"	A9, A10	"
5.	"	"	1500KC	"	1500KC	"	A11, A12, A13	"
6.	1000Ω Carbon Resistor in series with 125 MMD	"	2.2MC	Band 2	2.2MC	"	A14, A15, A16	Adjust in order given until maximum deflection is obtained with lowest signal generator output.
7.	"	"	6MC	"	6MC	"	A17, A18 A19	"
8.	"	"	"	Band 3	"	"	A20, A21 A22	"
9.	"	"	16MC	"	16MC	"	A23	"
10.	"	"	15MC	"	15MC	"	A24, A25	"

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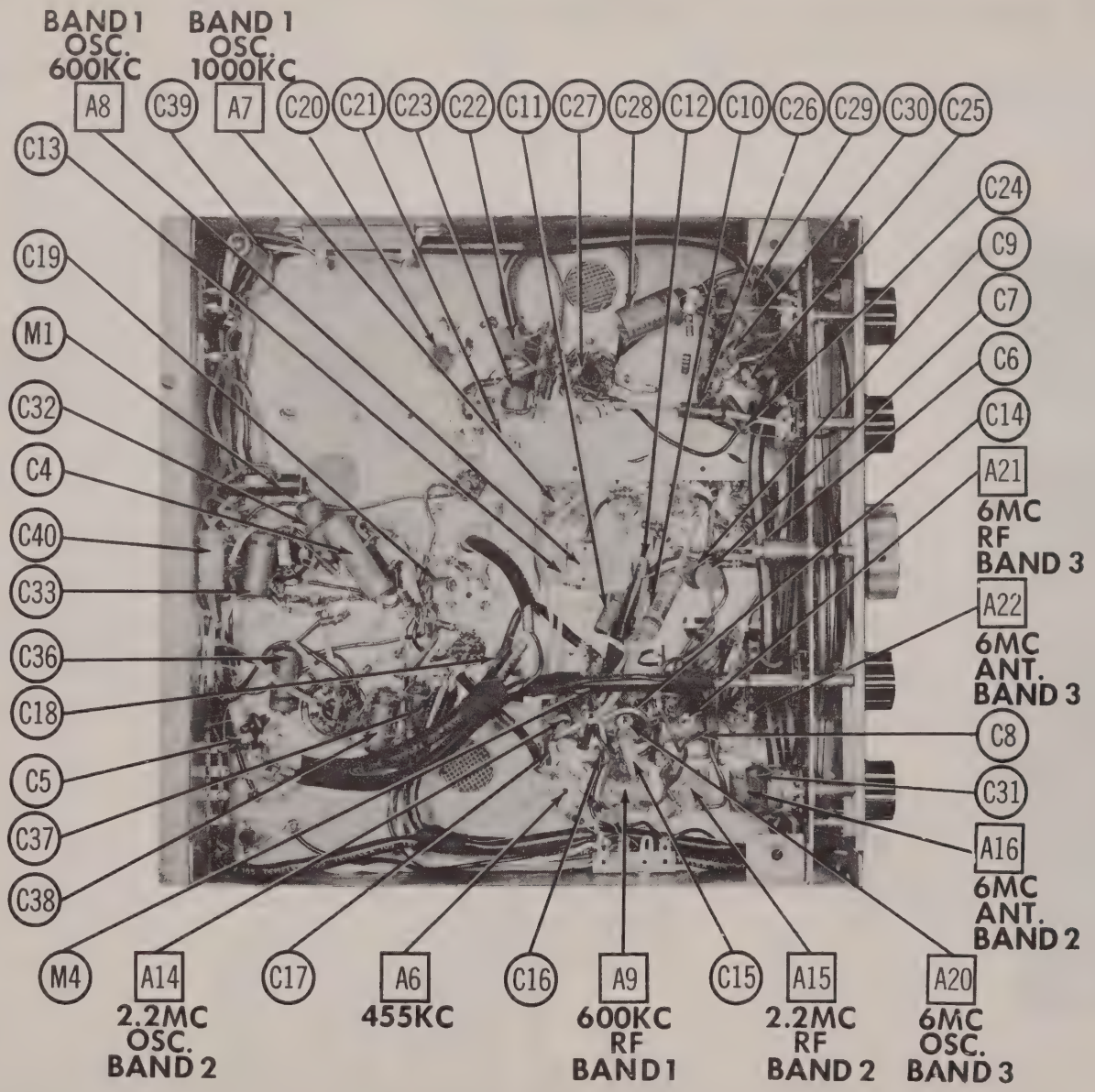
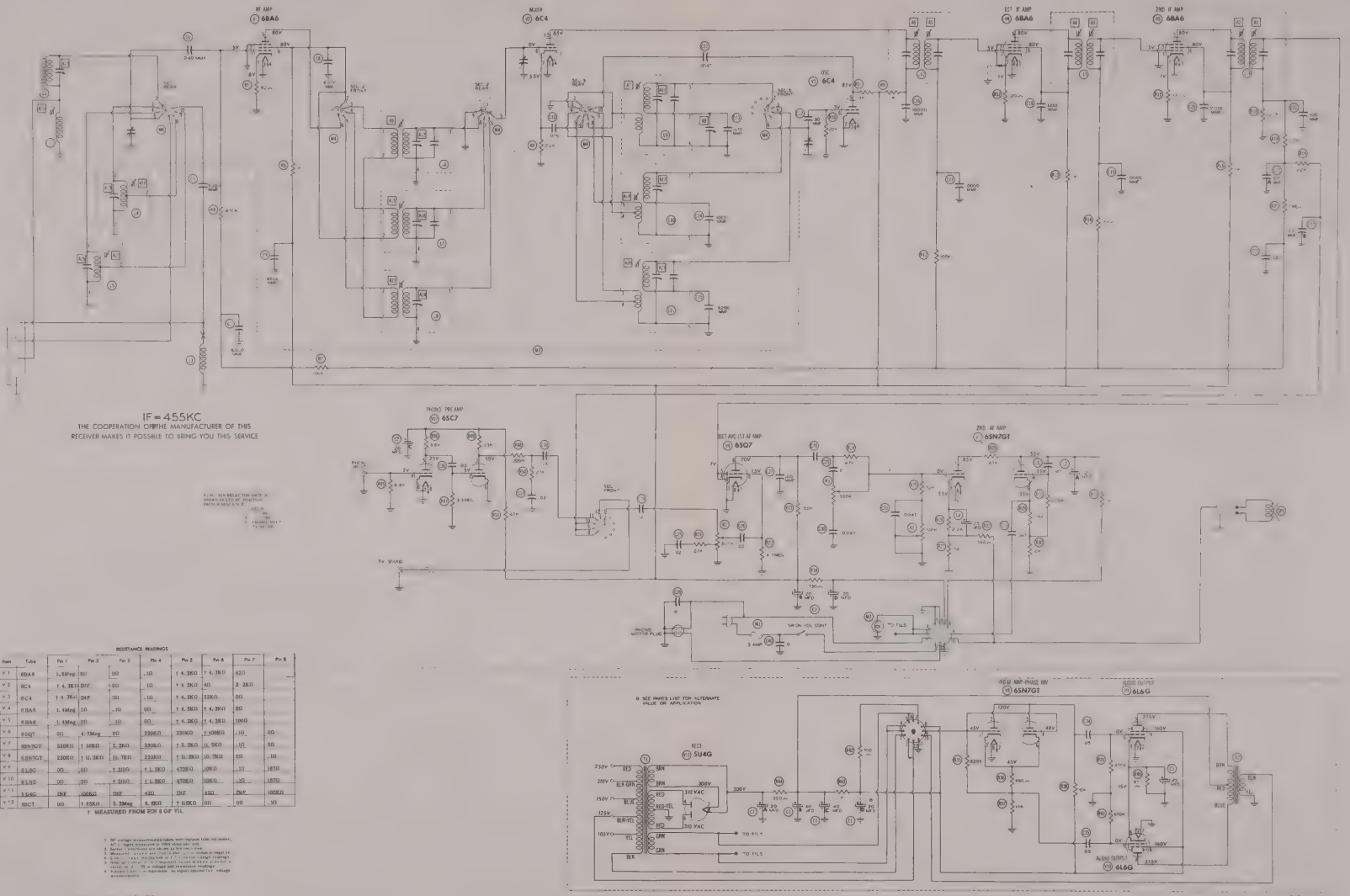


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V-1	6BA6	1.65Meg	80	00	10	† 4.3KΩ	† 4.3KΩ	820	
V-2	6C4	† 4.3KΩ	INF	00	150	† 4.3KΩ	470	2.2KΩ	
V-3	6C4	† 4.3KΩ	INF	00	150	† 4.3KΩ	22KΩ	00	
V-4	6BA6	1.44Meg	00	10	00	† 4.3KΩ	† 4.3KΩ	00	
V-5	6BA6	1.44Meg	00	10	00	† 4.3KΩ	† 4.3KΩ	100Ω	
V-6	6SQ7	00	4.7Meg	00	220KΩ	220KΩ	† 100KΩ	10	00
V-7	6BN7GT	520KΩ	† 560KΩ	2.2KΩ	220KΩ	† 2.3KΩ	11.5KΩ	150	00
V-8	6BN7GT	230KΩ	† 11.3KΩ	10.7KΩ	230KΩ	† 11.3KΩ	10.7KΩ	00	10
V-9	6L6G	00	00	† 310Ω	† 1.3KΩ	470KΩ	10KΩ	10	187Ω
V-10	6L6G	00	00	† 310Ω	† 1.3KΩ	470KΩ	10KΩ	10	187Ω
V-11	5U4G	INF	100KΩ	INF	42Ω	INF	42Ω	INF	100KΩ
V-12	6SC7	00	† 85KΩ	3.3Meg	8.8KΩ	† 85KΩ	00	00	10

† MEASURED FROM PIN 8 OF V11.

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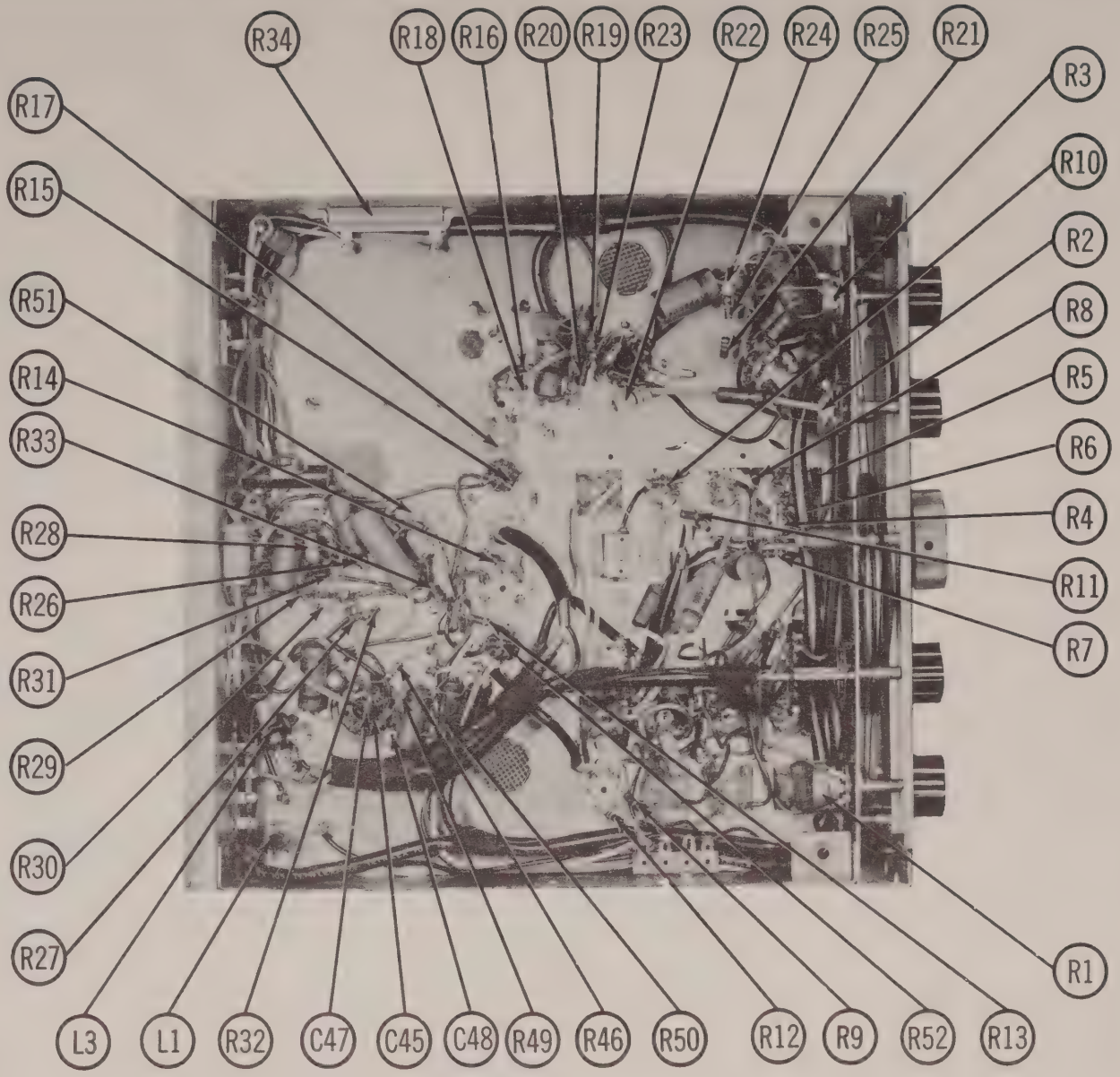
233-10



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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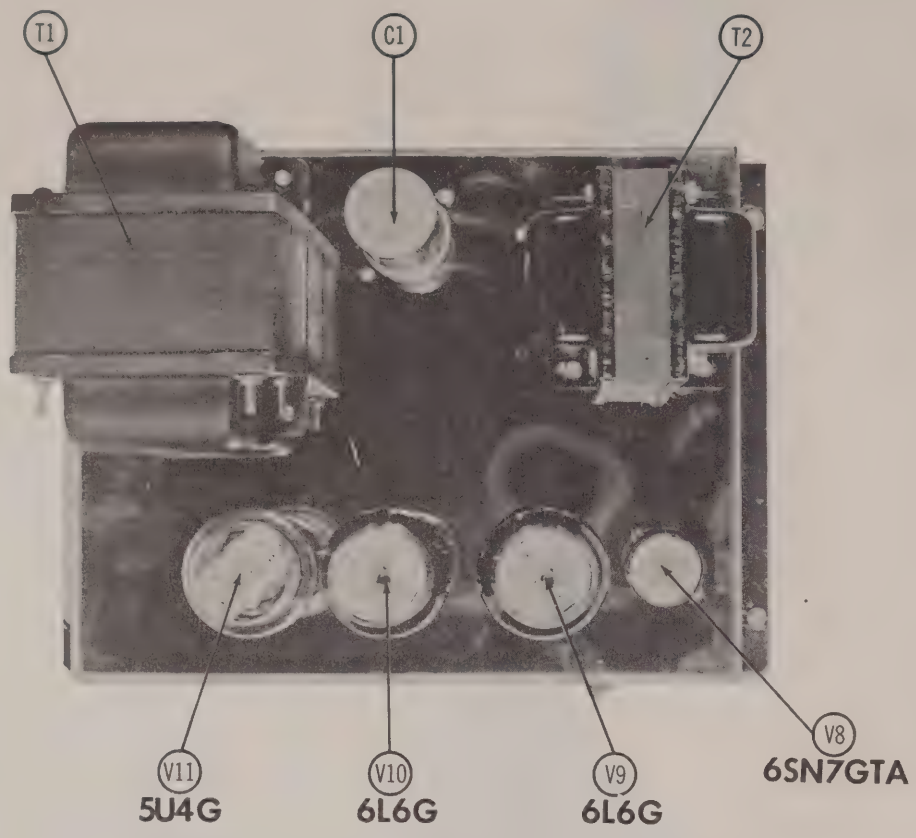
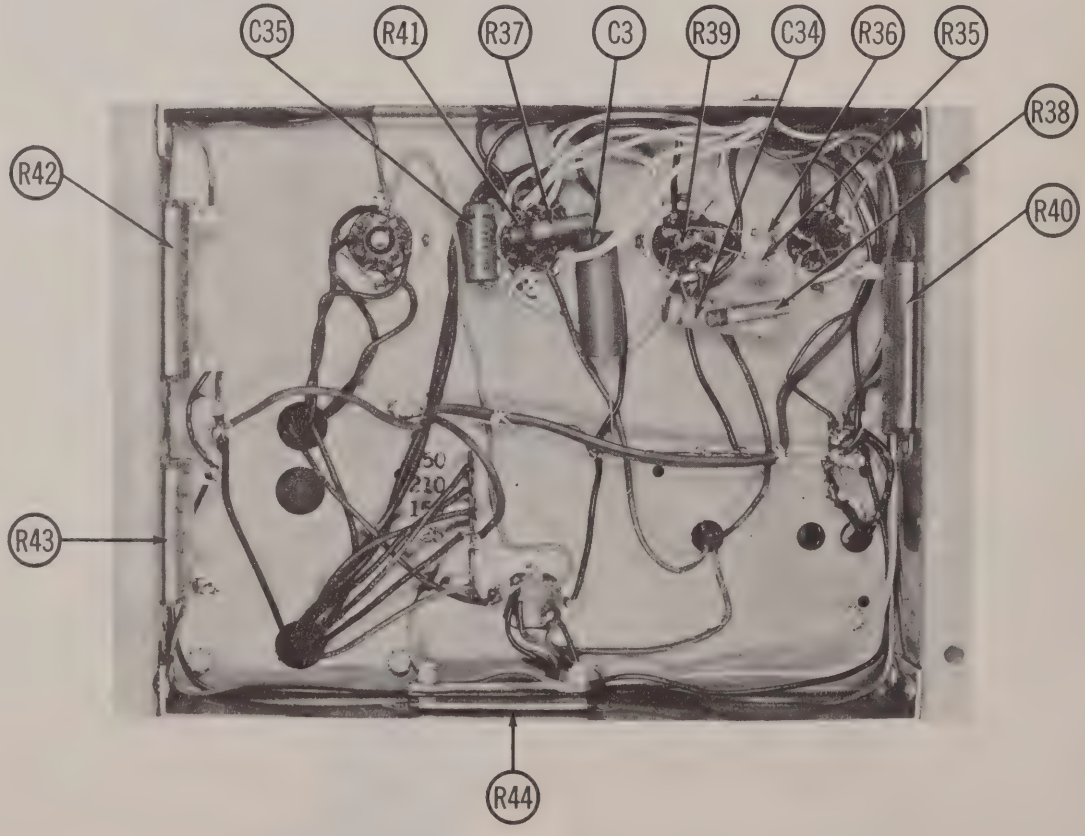


POWER SUPPLY CHASSIS-TOP VIEW



POWER SUPPLY CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

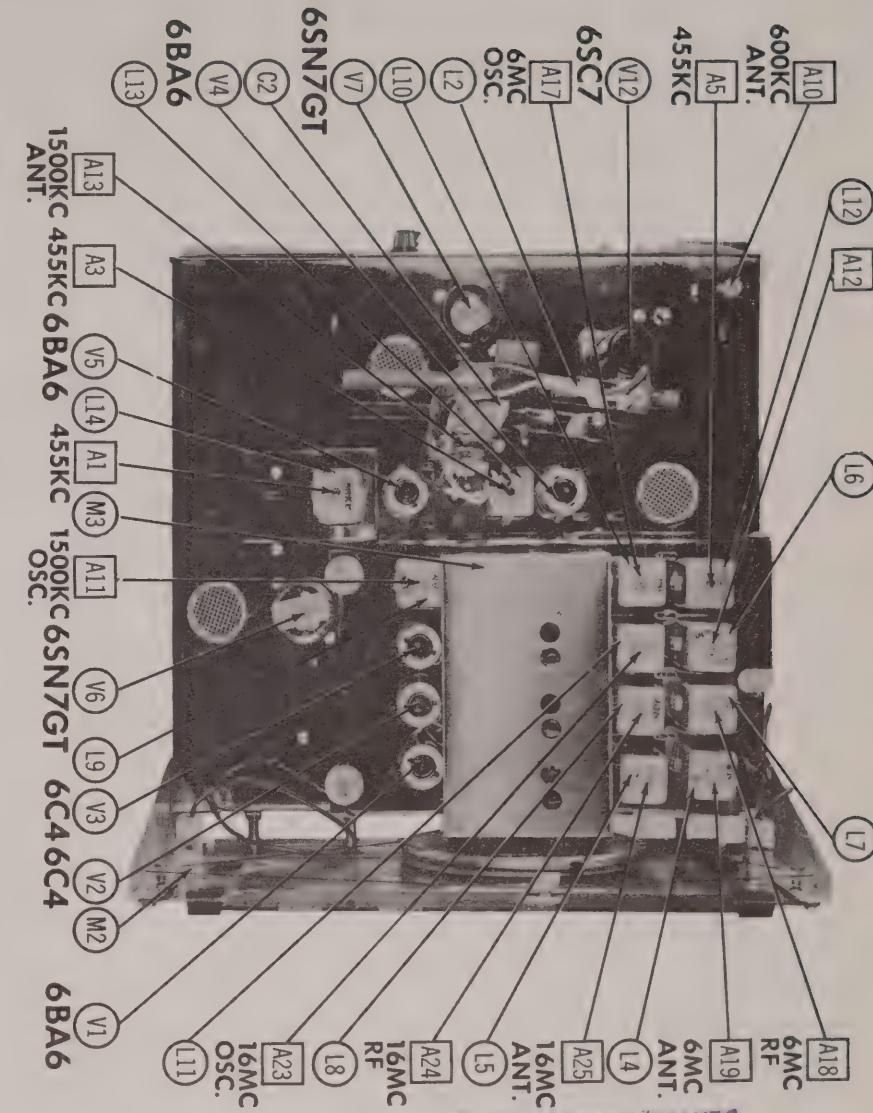
ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SCOTT PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Mixer	6C4	6C4	6BG	
V3	Oscillator	6C4	6C4	6BG	
V4	1st IF Amplifier	6BA6	6BA6	7BK	
V5	2nd IF Amplifier	6BA6	6BA6	7BK	
V6	Det-AVC-1st Amplifier	6SQ7	6SQ7	8Q	
V7	2nd AF Amplifier	6SN7	6SN7	8BD	
V8	3rd AF Amplifier Phase Inverter	6SN7	6SN7	8BD	
V9	Output	6L6G	6L6G	7S	
V10	Output	6L6G	6L6G	7S	
V11	Rectifier	5U4G	5U4G	5T	
V12	Phono Pre. Amp.	6SC7	6SC7	8S	

CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■20	450		AFH3-42		CO33		FP447	TVL-3786	
B	▲40	450								
C	▲40	450								Note 1
D	20	450								
C2A	▲20	450								
B	■20	450	CLC-10071	AFH4-14		DO13		FP444	TVL-4763	
C	▲20	450								
D	20	450								
C3	25	50	CLA-10026	PRS50/25		BR255		TC36	TVA-1306	
C4	25	50	CLA-10026	PRS50/25		BR255		TC36	TVA-1306	
C5	5000	500	CM15502	1467-005		1D5D5		MC465	1FM-25	
C6	240	500	CM1524IA	1468-00025		5W5T25		MC240	1FM-325	
C7	10000		CCA-15103	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C8	10000		CCA-15103	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C9	10000		CCA-15103	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C10	.005	600	CP16502	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C11	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C12	50		CC-15500B	SI50	D6-500	TM5Q5	GP2-333-500	UC-545	5GA-Q5	
C13	470	500	CM-15471B							
C14	1000	500	CM-15102B	1468-001		1W5D1		MC255	1FM-21	
C15	6200	500	CM-15622B							
C16	10000		CCA-15103	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C17	10000		CCA-15103	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C18	10000		CCA-15103	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C19	10000		CCA-15103	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C20	10000		CCA-15103	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C21	100		CCA-15101A	BPD-0001	DD-101	TM5T1	812-0001	UC-531	5GA-T1	
C22A	100		CCXA-10005	BPD-0001	DD-101	TM5T1	812-0001	UC-531	5GA-T1	
B	100			BPD-0001	DD-101	TM5T1	812-0001	UC-531	5GA-T1	
C23	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	Note 2
C24	.02	200	CP-16203	P288-02	DF-203	PJ2S2		PT412	2TM-S2	
C25	.02	200	CP-16203	P288-02	DF-203	PJ2S2		PT412	2TM-S2	
C26	.02	200	CP-16203	P288-02	DF-203	PJ2S2		PT412	2TM-S2	
C27	100		CCA-15101A	SI100	D6-101	TM5T1	GP2K-101	UC-531	5GA-T1	
C28	.1	600	CP-16104	P688-1	DF-104	PTE6P1		PT601	6TM-P1	Note 3
C29	.01	600	CP-16103	P688-01	DD-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C30	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C31	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C32	.047	600		P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C33	.047	600		P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C34	.05	600	CP-16503	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C35	.05	600	CP-16503	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C36	.05	600	CP-16503	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C37	.02	600	CP-16203	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C38	.05	600	CP-16503	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C39	.01	600	CPMA-16103						PX24B13	
C40	.01	600	CPMA-16103						PX24B13	

Note 1. Some Models may use a 20-20-20-20 @ 450V in this application.
Note 2. Some Models may use a .1MFD @ 600V in this application.
Note 3. Some Models may use a .05MFD @ 600V in this application.

CHASSIS—TOP VIEW



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DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SCOTT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	VCA-11112	A11-133	AG-58-S	B-59-S	U-50	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	500KΩ	½	70V4583	Q18-133X	AT-88	BT-66	UT-429	Volume tapped at 50K - Note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	VCA-11111	Q11-133	AG-58-S	B-59	U-50	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SCOTT PART No.	IRC PART No.	
R4	470KΩ	½	RC-34703A	BTS-470K	
R5	82Ω	½	RC-30820A	BTS-82	
R6	1000Ω	½	RC-31001A	BTS-1000	
R7	100KΩ	½	RC-31003A	BTS-100K	
R8	2200Ω	½	RC-32201A	BTS-2200	
R9	1000Ω	½	RC-31001A	BTS-1000	
R10	22KΩ	½	RC-32202A	BTS-22K	
R11	1000Ω	½	RC-31001A	BTS-1000	
R12	100KΩ	½	RC-31003A	BTS-100K	
R13	1000Ω	½	RC-31001A	BTS-1000	
R14	100KΩ	½	RC-31003A	BTS-100K	
R15	100Ω	½	RC-30100A	BTS-100	
R16	1000Ω	½	RC-31001A	BTS-1000	
R17	220KΩ	½	RC-32203A	BTS-220K	
R18	47KΩ	½	RC-34702A	BTS-47K	
R19	22KΩ	½	RC-32202A	BTS-22K	
R20	1Meg	½	RC-31004A	BTS-1Meg	
R21	27KΩ	½	RC-32702A	BTS-27K	
R22	4.7Meg	1	RC-34704A	BTA-4.7Meg	
R23	100KΩ	½	RC-31003A	BTS-100K	
R24	47KΩ	½	RC-34702A	BTS-47K	
R25	22KΩ	½	RC-32202A	BTS-22K	
R26	2200Ω	½	RC-32201A	BTS-2200	
R27	56Ω	½	RC-30560A	BTS-56	
R28	47KΩ	½	RC-34702A	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SCOTT PART No.	IRC PART No.	
R29	1500Ω	½		BTS-1500	
R30	10KΩ	½	RC-31002A	BTS-10K	
R31	220KΩ	½	RC-32203A	BTS-220K	
R32	560Ω	½	RC-35600A	BTS-560	
R33	1000Ω	½	RC-31001A	BTS-1000	
R34	750Ω	10	RXA-10031		
R35	220KΩ	½		BTS-220K	
R36	680Ω	½		BTS-680	
R37	10KΩ	1		BTA-10K	
R38	10KΩ	1		BTA-10K	
R39	470KΩ	½		BTS-470K	
R40	167Ω	5	RX-10020		
R41	470KΩ	½	RC-34703A	BTS-470K	
R42	300Ω	10	RXA-10024		
R43	1000Ω	10	RXA-10025		
R44	1250Ω	5	RXA-10027		
R45	6800Ω	½	RC-36801A	BTS-6800	
R46	68KΩ	½	RC-36802A	BTS-68K	
R47	3.3Meg	½	RC-33304A	BTS-3.3Meg	
R48	220KΩ	½	RC-32203A	BTS-220K	
R49	33KΩ	½	RC-33302A	BTS-33K	
R50	27KΩ	½	RC-32702A	BTS-27K	
R51	47KΩ	½	RC-34702A	BTS-47K	
R52	120Ω	½		BTS-120	Note

Note : Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	SCOTT PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.
T1	117VAC ② 1.6A	615VCT .145ADC	5VAC ⓐ 3A	6.3VAC 5.6A	TPC-10017				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SCOTT PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4.5ΩCT	16Ω tap ⓐ 8Ω	164Ω	.57Ω tap ⓐ .48Ω	TOC-10060	A-8053 ①	A-3100 ①②	H4100 ①	S-35A ①	① Drill new mounting holes. ② Use high taps on primary only.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SCOTT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Loading Coil	.4Ω		LVA-10002				Band 1 (535-1650KC)
L2	Ant. Coil	.4Ω		ALA-10033				Band 1
L3	Ant. Loading Coil	7.5Ω			19-3125		6153	Bands 2 & 3; 2-6MC & 6-20MC; Note 1
L4	Ant. Coil	.9Ω		TRFA-10038				Band 2; 2-6MC-tapped ⓐ .2Ω
L5	Ant. Coil	.3Ω		TRFA-10039				B and 3; 6-20MC-tapped ⓐ .1Ω
L6	RF Coil	120Ω	3.9Ω	TRFA-10035				Band 1
L7	RF Coil	.7Ω	1.1Ω	TRFA-10036				Band 2
L8	RF Coil	2.8Ω	.2Ω	TRFA-10037				Band 3
L9	Osc. Coil	.3Ω	3Ω	TRCA-10027				Band 1
L10	Osc. Coil	2.5Ω	.9Ω	TRCA-10028				Band 3; Pri: tapped ⓐ 2.2Ω
L11	Osc. Coil	1.3Ω	.2Ω	TRCA-10029				Band 3; Pri: tapped ⓐ 1.1Ω
L12	1st IF Trans.	12Ω	12Ω	TSA-10053A	16-6667 †	BC-369 †	1312-C4 †	
L13	2nd IF Trans.	12Ω	12Ω	TSA-10053A	16-6667 †	BC-369 †	1312-C4 †	
L14	3rd IF Trans.	12Ω	12Ω	TSA-10053A	16-6667 †	BC-369 †	1312-C4 †	

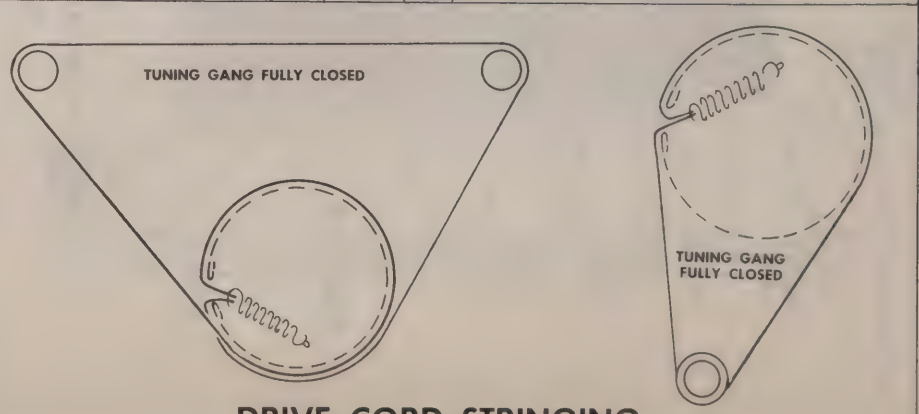
Note 1. Not used in all models; 128 Microhenries.
† Drill ① new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SCOTT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 250V			312003	342001	AGC3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	SCOTT PART No.	NOTES
M2	Dial light		# 47 bayonet (2 used)
M3	Tuning cap	CVB-10027	3 section (19-497MMF each)
M4	Switch		Function
A13	Trimmer cap	CTA-10009	Loop antenna (0-50MMF)
A8	Trimmer cap	CTA-10005	AM low freq. padder (25-250MMF)
	Dial glass	DSB-10122	Calibrated
	Knob	KA-10130	Tuning
	Knob	KA-10131A	Control (4 used)



DRIVE CORD STRINGING

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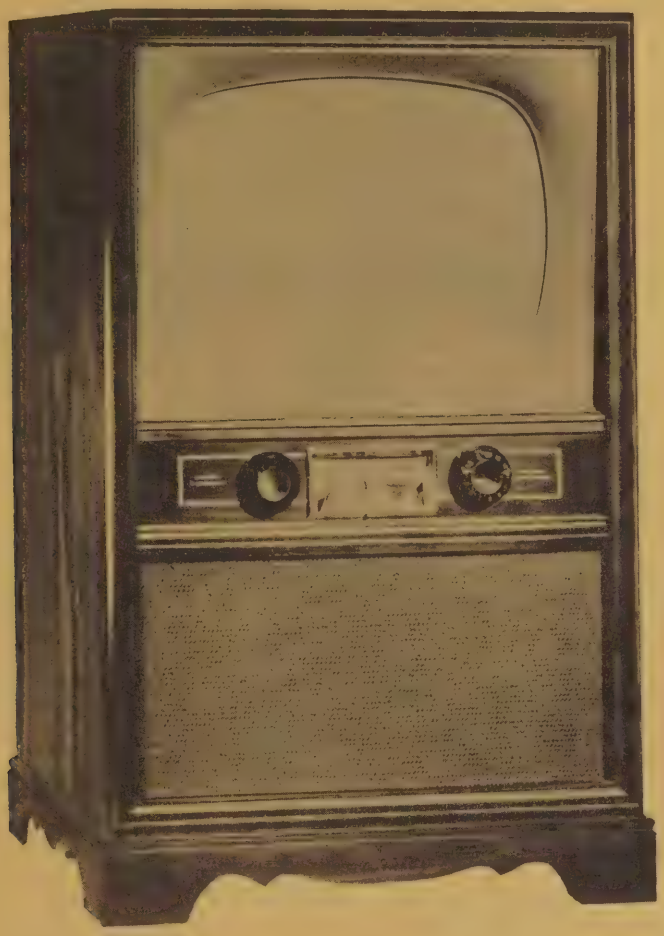

MODEL 2D1331A

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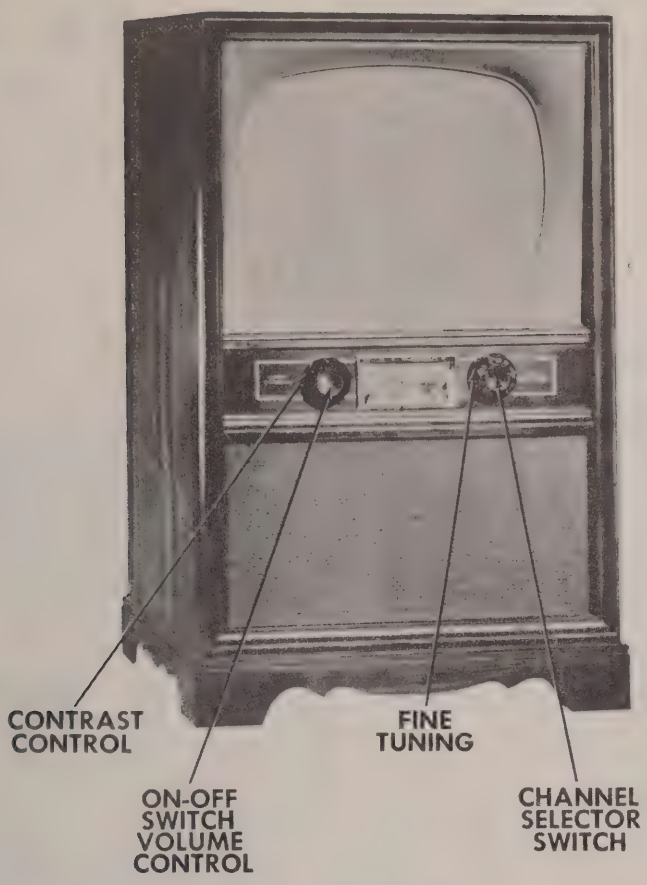

TRUETONE
MODELS 2D1331A, B, 2D2334A

TRUETONE MODEL 2D1331A

TRADE NAME	Truetone Models 2D1331A, 2D1331B, 2D2334A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Twenty-Five

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2 Amp. @ 117 Volts AC
TUNING RANGE–Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 26.2 MC, Sound IF 21.7 MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Drive Cord Stringing 16
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 13 thru 16
Photographs
- Cabinet-Rear View 11
- Capacitor Identification 4, 9
- Chassis - Top View 3
- RF Tuner 10
- Resistor Identification 19, 20
- Trans., Inductor & Alignment Identification 17

Resistance Measurements 8
Servicing in the Field 18
Schematic 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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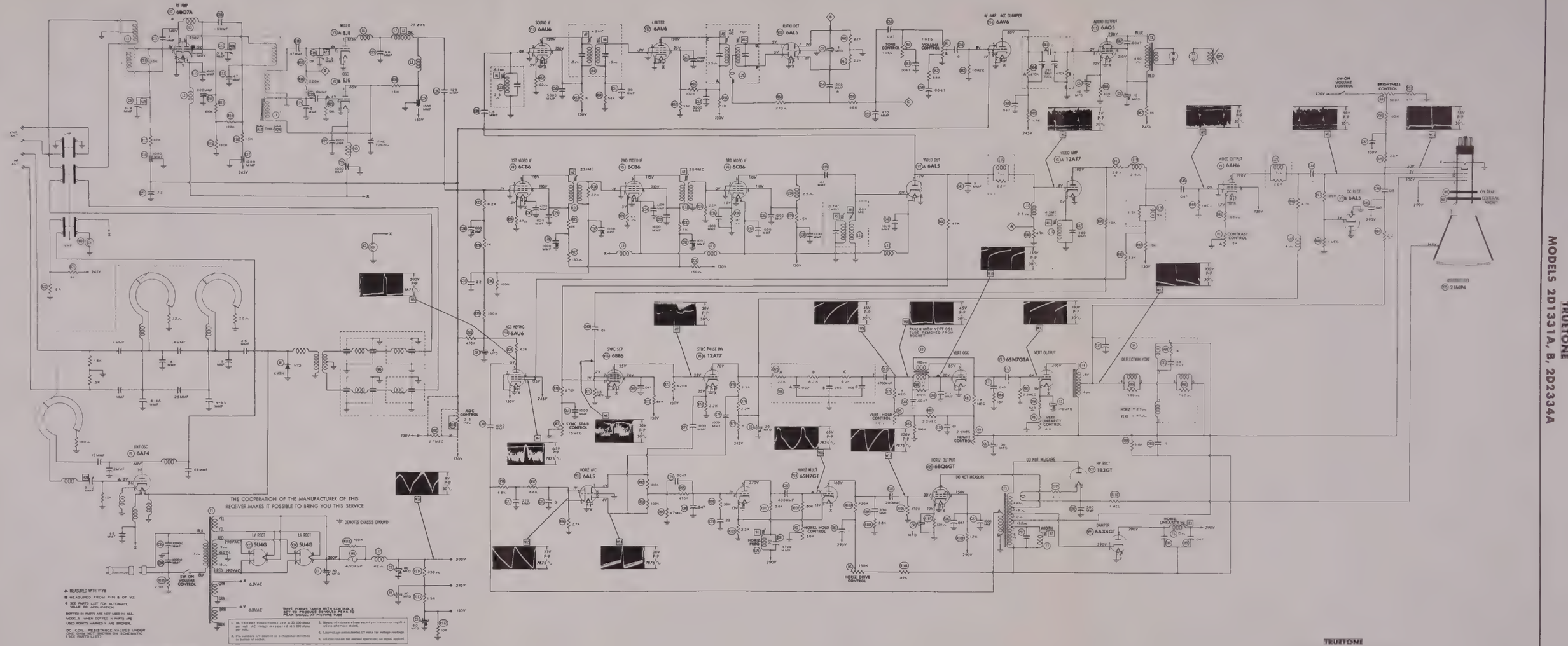
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
▲ MEASURED WITH VTVM
■ MEASURED FROM Pin 8 OF V2
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
DC COIL RESISTANCE VALUES UNDER (Dots Only NOT SHOWN ON SCHEMATIC (SEE PARTS LIST)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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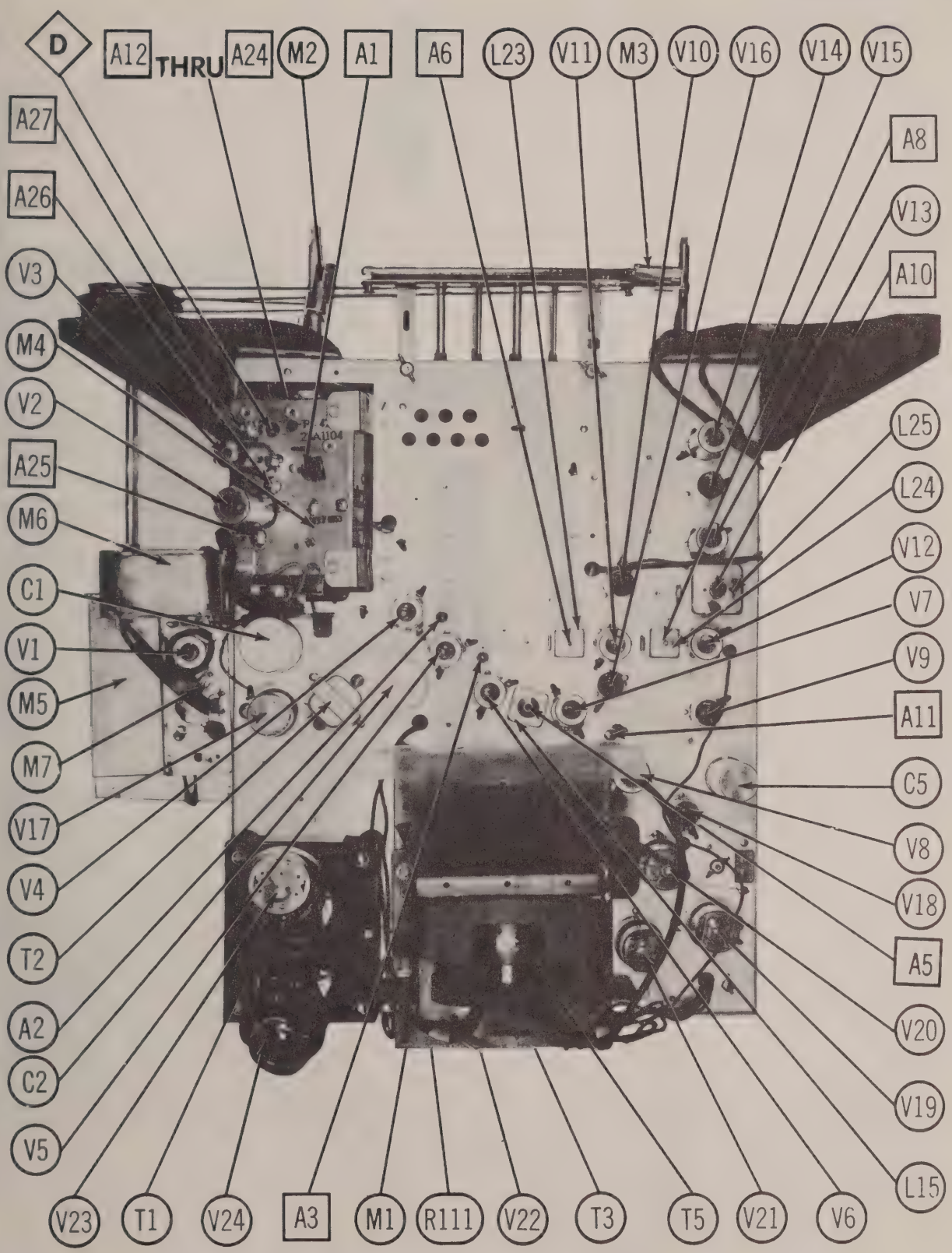

CHASSIS TOP VIEW

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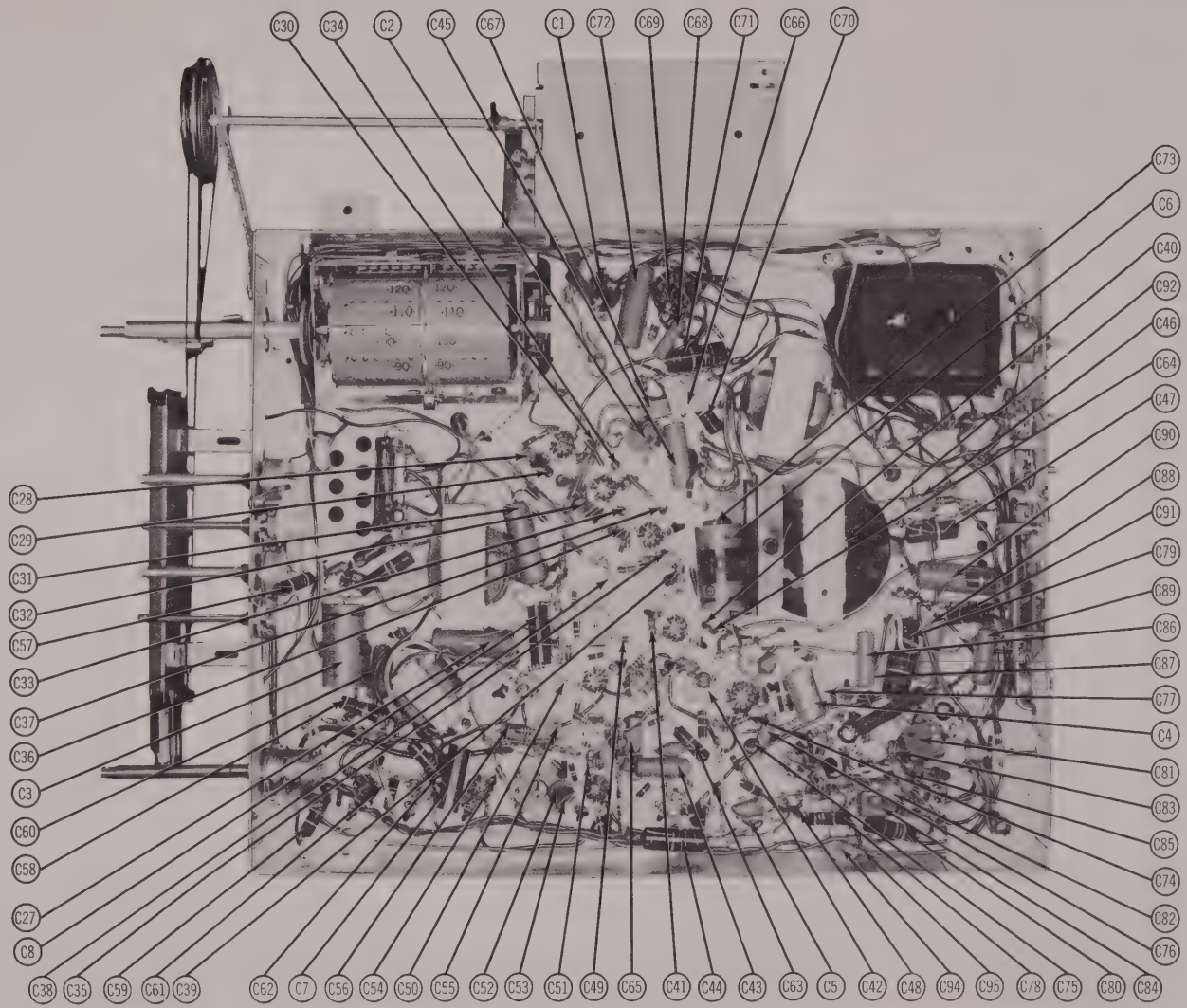

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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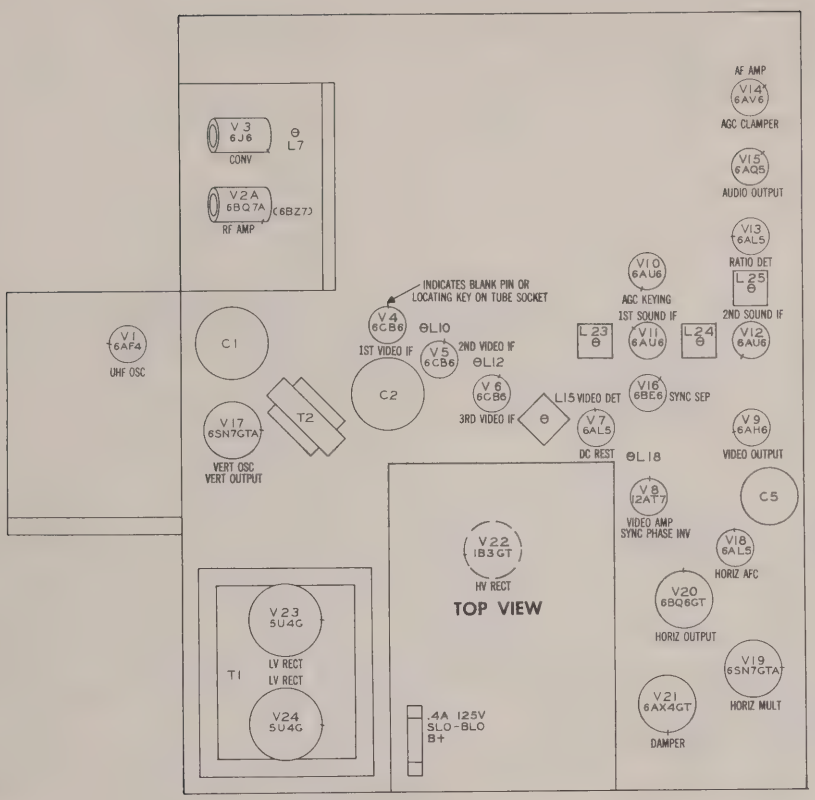

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V23, V24, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V9, V25**
Has pic, no sound - **V11, V12, V13, V14, V15**
Overloaded picture - **V10, V14**

SYNC FAILURE
No vert. sync - **V8, V17**
No horiz. sync - **V8, V18, V19**
No vert. or horiz. sync - **V8, V16**

SWEEP FAILURE
No raster, has sound - **V18, V20, V21, V22, V25**
No vertical deflection - **V17**
Poor vert. linearity or foldover - **V17**
Poor horiz. linearity or foldover - **V19, V20, V21**
Narrow picture - **V18, V20, V21, V22, V23, V24**
Vert. off freq. - **V8, V17**
Horiz. off freq. - **V8, V18, V19**

TRUETONE
MODELS 2D1331A, B, 2D2334A

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, V19.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5Volt bias supply to the ungrounded side of C31. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.2MC (Unmod.)	Any	DC probe thru decoupling filter (Fig.1) to point A . Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.1MC	"	"	A2	"
3.	"	"	25.9MC	"	"	A3	"
4.	"	"	24.1MC	"	"	A4	"
5.	"	"	21.7MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.7MC 23.0MC 23.5MC 25.25MC 26.2MC	Any	Vert. Amp. thru decoupling filter (Fig. 1) to point A . Low side to chassis.		Check for response curve similar to Fig.3. If necessary retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point B . Common to chassis.	A6, A7, A8, A9	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point C . Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru decoupler (Fig.1) to point B . Low side to chassis.	A6, A7, A8, A9	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitide and symmetry as in Fig. 3.
8.	"	"	"	"	"	Vert. Amp. thru decoupler (Fig.1) to point C . Low side to chassis.	A10	Reconnect stabilizer capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Turn contrast control to maximum clockwise position.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to pin 7 of 6AL5 (V7A). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any	Vert. amp. thru decoupler (Fig.1) to pin 2 of picture tube. Low side to chassis.	A 11	Adjust for minimum 400∿ indication on scope

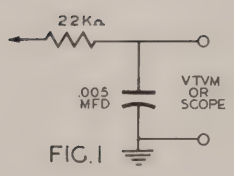

FIG.1

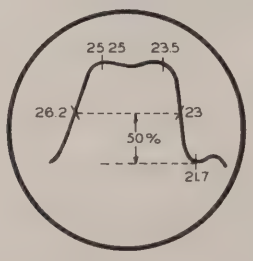

FIG.2

FIG. 3

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ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The oscillator adjustment screws for each channel are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupler (Fig.1) to point A . Low side to chassis.	A12	Adjust to place sound marker in notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	
11.	"	Across output of UHF tuner	124MC (10MC Swp)	121.75MC 126.25MC	UHF		A24	

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru decoupler (Fig.1) to point D . Low side to chassis.	A25, A26 A27	Adjust for response curve similar to Fig.6. with markers above 90%.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig.6. If markers fall below 70% on any channel make slight compromise adjustment of A24, A25, and A26 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.75MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
			124MC (10MC Swp)	121.75MC 126.25MC	UHF			

UHF TUNER ALIGNMENT

Due to circuit complexity of the UHF tuner, alignment in the field should not be attempted.
Service should also be limited to the replacement of oscillator tube (V3) and crystal 1N72/1N82.
If either crystal or oscillator is replaced adjustment of the UHF oscillator trimmer, A28, maybe necessary. If necessary, adjust A28 for tuner range of below 470MC to above 890MC.
If the UHF tuner does not operate properly after tube or crystal replacement and adjustment of A28 the tuner should be returned to the factory.

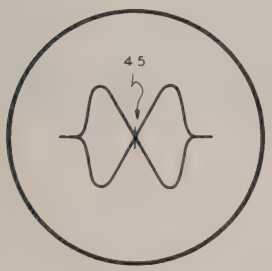


FIG. 4

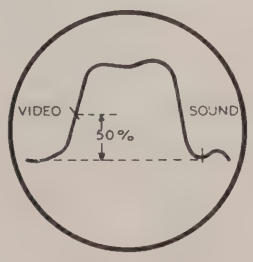


FIG.5

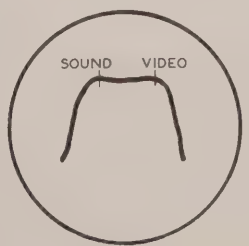
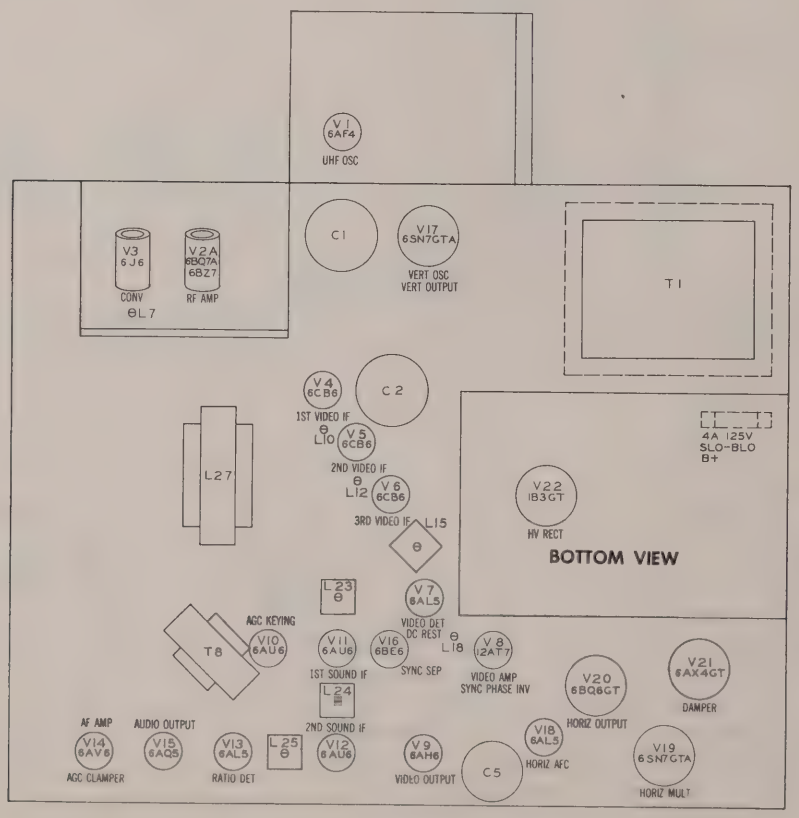


FIG. 6

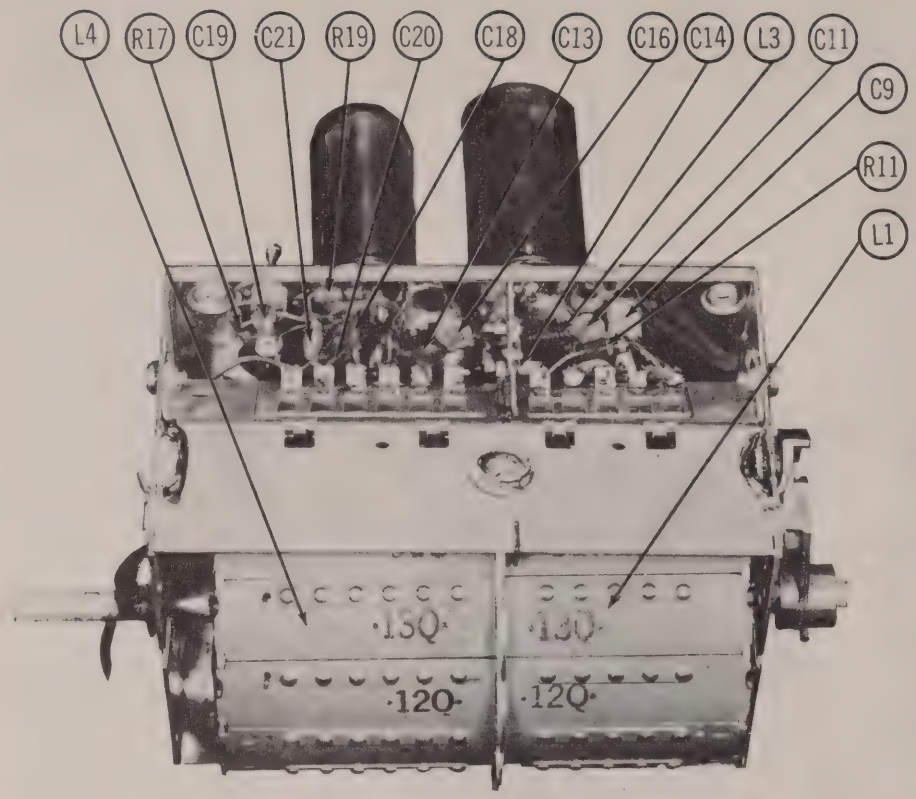
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■6KΩ	12KΩ	.1Ω	.2Ω	.1Ω	12KΩ	■6KΩ		
V 2	6BQ7A	INF	680KΩ	0Ω	.1Ω	0Ω	■2KΩ	160KΩ	INF	0Ω
V 3	6J6	17KΩ	■2KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 4	6CB6	110KΩ	47Ω	.1Ω	0Ω	■2.8KΩ	■2.8KΩ	0Ω		
V 5	6CB6	100KΩ	47Ω	.1Ω	0Ω	■2.8KΩ	■2.8KΩ	0Ω		
V 6	6CB6	.3Ω	180Ω	.1Ω	0Ω	■3KΩ	■3KΩ	0Ω		
V 7	6AL5	.7Ω	0Ω	.1Ω	0Ω	1Meg	0Ω	4.7KΩ		
V 8	12AT7	■8.5KΩ	4.7KΩ	.2Ω	0Ω	0Ω	■7.5KΩ	■820KΩ	2.2KΩ	.1Ω
V 9	6AH6	1Meg	0Ω	.1Ω	0Ω	■6.2KΩ	■1.8KΩ	500Ω		
V 10	6AU6	■36.5K	■1.8KΩ	.1Ω	0Ω	470KΩ	■400Ω	■1.8KΩ		
V 11	6AU6	.1Ω	0Ω	.1Ω	0Ω	■2.6KΩ	■2.6KΩ	100Ω		
V 12	6AU6	56KΩ	0Ω	.1Ω	0Ω	■2.6KΩ	■24KΩ	0Ω		
V 13	6AL5	INF	INF	0Ω	.1Ω	22KΩ	INF	22KΩ		
V 14	6AV6	10Meg	0Ω	.1Ω	0Ω	680KΩ	680KΩ	■520KΩ		
V 15	6AQ5	470KΩ	330Ω	0Ω	.1Ω	■1.7KΩ	■1.3KΩ	470KΩ		
V 16	6BE6	40KΩ	0Ω	.1Ω	0Ω	■820KΩ	■70KΩ	1.5Meg		
V 17	6SN7GT	2Meg	▲1.7Meg	0Ω	2.2Meg	▲7KΩ	2KΩ	.1Ω	0Ω	
V 18	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	9KΩ	INF	9KΩ		
V 19	6SN7GT	170KΩ	▲340KΩ	2.2KΩ	5Meg	■5.6KΩ	2.2KΩ	.1Ω	0Ω	
V 20	6BQ6GT	5.6KΩ	0Ω	INF	■12KΩ	470KΩ	420KΩ	.1Ω	100Ω	TOP CAP ▲16Ω
V 21	6AX4GT	6.3KΩ	INF	440KΩ	4.5Meg	■50Ω	6.3KΩ	0Ω	.1Ω	
V 22	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲446Ω
V 23	5U4G	INF	10KΩ	INF	18Ω	INF	19.5Ω	INF	10KΩ	
V 24	5U4G	INF	10KΩ	INF	18Ω	INF	19.5Ω	INF	10KΩ	
V 25	21MP4	0Ω	1.1Meg	PIN 6 ■50Ω	PIN 10 ▲6.8KΩ	PIN 11 ■180KΩ	PIN 12 .1Ω			

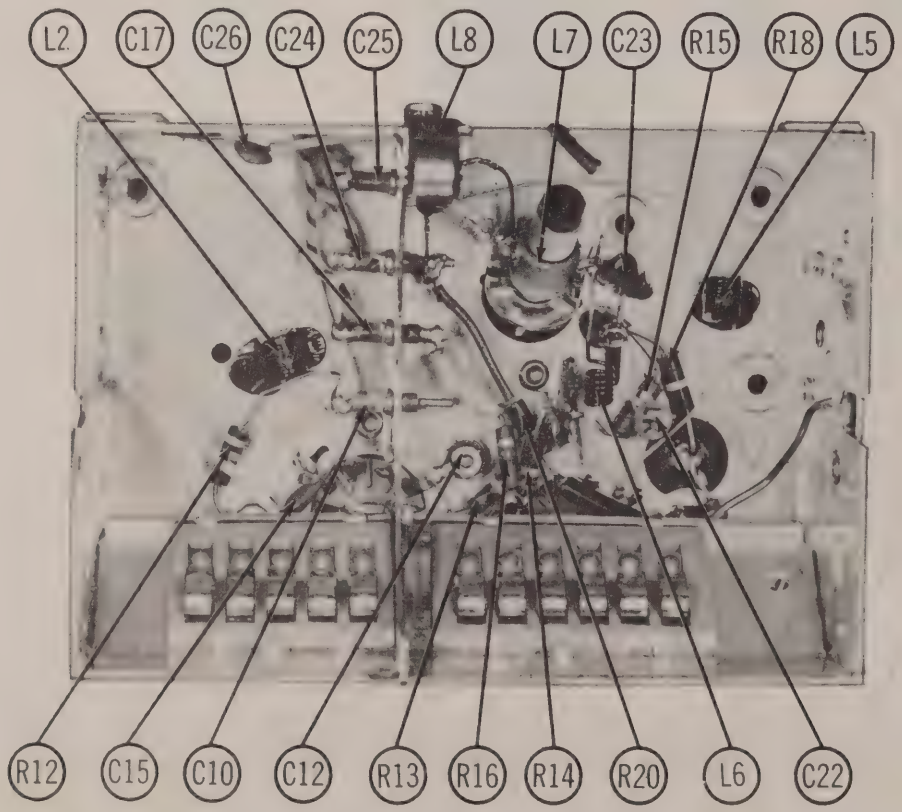
■MEASURED FROM PIN 2 OF V24.
▲MEASURED FROM PIN 3 OF V21.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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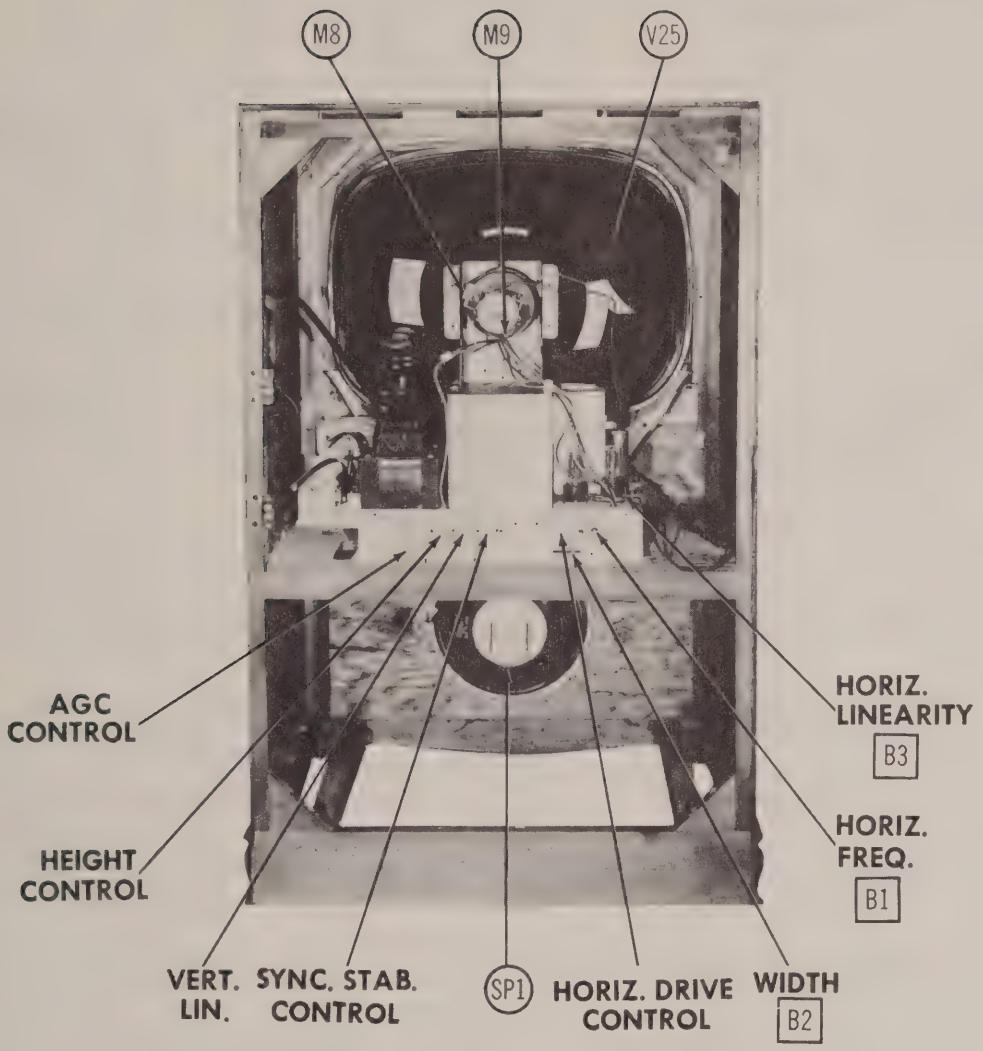
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture falls into sync.

Adjust the horizontal drive control for the best compromise between brightness and linearity.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20, V21, V23 and V24. Check adjustment of horiz. drive control, B2 and B3. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check C86, C87, C90, C91, T3, T5A, R108 and other associated components.	Check C82, C83, C84, C85, R103, R104, R106, R101, R100, R6 and other associated components.

DRIVE LINES

Check adjustment of horiz. drive control. Check by substitution V19, V20 and V21. Check C83, C84, C85, C88, C89, T3, T5A and other associated circuit components.

COMPRESSED LEFT SIDE

Check horiz. drive adjustment. Check adjustment of B2 and B3. Check by substitution V19, V20 and V21. Check T3, T5A, C86, C87 and other associated components.

FOLDS

Check by substitution V19, V20 and V21. Check T3, T5A and other associated components.

XMAS TREE EFFECT

Substitute V19. Check C81, C82 and other components associated with V19.

VERTICAL

LOSS OF SWEEP

Substitute V17. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T4 and T5B.	Check C71, C72, C68, C69, R88, R81 and other associated components.

INSUFFICIENT SWEEP

Substitute V17. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V17. Check R81, R9, C70, R85, C72 and other associated circuit components.

COMPRESSED AT TOP

Substitute V17. Check C2B, T4, T5B, R8 and other associated components.

FOLDS

Substitute V17. Check assoicated circuit components.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check components associated with V18 and V19 especially R98, R97, R95 R99, C76, C77, C79 and C80.	Check C74, C75, R92 and R93.

CRITICAL HOLD

Check by substitution V18 and V19. Check adjustment of B1. Follow procedure outlined under "Loss of Sync".

HORIZONTAL BENDING OR S-ING

Check by substitution V19, V20, V16 and V8. Check adjustment of sync stability and AGC threshold controls. Check C1A and C2A.

VERTICAL

LOSS OF SYNC

Check by substitution V16, V8 and V17. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check components associated with V17 especially C68 and T2.	Check vert. integrator network C67, C63 and other components associated with V16 and V8.

CRITICAL HOLD

Substitute V17, V16 and V8. Check adjustment of sync stability and AGC threshold controls. Proceed as outlined under "Loss of Sync".

TRIGGERING

Check by substitution V17, V16 and V8. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Check by substitution V7, V8 and V9. Check picture tube and other associated components especially coupling capacitors and plate load resistors.

SOUND BARS (4.5 MC BEAT)

Check alignment of local oscillator. Check adjustment of 4.5 MC trap (A11). Check video IF alignment.

NEGATIVE PIX

Check by substitution V7, V8, V9 and V10. Check setting of the AGC threshold control. Check picture tube and other associated circuit components.

POOR CONTRAST

Check by substitution V1, V4, V5, V6, V7, V8 and V9. Check associated circuit components. Check picture tube.

SMEAR

Check by substitution V7, V8 and V9. Check L16, L20 and L21. Check C41, C43 and C44. Check R41, R42, R44 and R46 for change of value. Check picture tube and other associated components.

WIDE BLACK BAR ACROSS PIX

Check tuner, video IF, video detector and video amplifier tubes for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V14 and V15. Check stages of V14 and V15 using audio signed generator. Apply signal across R63.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V14 and V15 especially C61.

BUZZ

Realign audio IF and ratio detector following procedure outlined in the alignment section. If buzz is still objectionable substitute V13 and readjust A9 and A10. Check C54 and C7.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

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3844 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6J6	6J6	7BF	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V8	Video Amplifier Sync Phase Inv.	12AT7	12AT7	9A	
V9	Video Output	6AH6	6AH6	7BK	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	6BT	
V14	AF Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V15	Audio Output	6AQ5	6AQ5	7BZ	
V16	Sync Separator	6BE6	6BE6	7CH	
V17	Vert. Oscillator - Vert. Output	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				RETMA BASE TYPE	NOTES
	TRUETONE PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.		
V25	21MP4	21MP4	21MP4	21MP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲80	400	45X390	AFH3-46		CO37		FP378	R1341	
B	▲60	400								
C2A	▬80	400	45X391	AFH3-142		C109		FP375	TVL-3764	
B	▲100	50								
C3	30	400	45X393	PRS450/30		BR3045A		TC77	TVA-1711	
C4	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C5A	■20	400	45X392	AFH3-137		CO97		FP366	TVL-3751	
B	▲10	400								
C	40	50								
C6	30	400	45X393	PRS450/30		BR3045A		TC77	TVA-1711	
C7	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C8	4	100	45X361	PRS150/4		BR415		TC40	TVA-1402	
C9	3-9		31B-207		829-10					
C10	1000		13D-153	EF-001	MFT-1000				503C-D1	
C11	3		CD8C3R6C	SI3NP0						
C12	.5-3		31B-206		829-3			CT565A		
C13	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA- Q47	
C14	1000		13D-196	EF-001	MFT-1000				503C-D1	
C15	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C16	1.5		CD8C1R5M	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C17	1000		13D-153	EF-001	MFT-1000				503C-D1	
C18	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C19	.5-3		31B-206		829-3			CT565A		
C20	10		CD10C100K	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C21	5		CD8U050C	SI5N750	TCN-5		N750K-050		5TCUB-V5	
C22	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	6.8		CD8C6R8C	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C24	1000		13D-153	EF-001	MFT-1000				503C-D1	
C25	1000		13D-153	EF-001	MFT-1000				503C-D1	
C26	120		13D-055	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C27	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C28A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C29	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C30	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31	.22	200	RC10M2224M	P488-22		PTE4P22		PT 4025	2TM-P22	
C32A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C33	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C34	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C36	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C37	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C38	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C39	47		47X603	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C40	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C41	5		47X562	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C42	360	500	47X568							
C43	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C44	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C45	.047	600	RCP10M6473M	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C46	.015	600	RCP10M6153M	P688-015		PTE6S15		PT6115	6TM-S15	
C47	.1	200	RCP10M2104M	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C48	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C49	1.5		47X584	811-5NP0	TCZ-1.5		NPO(-)R15	ZT-5515	5TCCB-V15	
C50	5000		47X507	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C51	100		47X604	SI00	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C52	5000		47X507	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C53	5000		47X507	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C54	1000		50X1	BPD-001	DD-102	TM5D1	801-001	DC-531	5HK-D1	Note 1
C55	470	500	47X253	1469-0065		SR5T5		MCB245	MS-25	
C56	.047	600	RCP10M2473M	P688-047	DF-503	PTE6347		PT6147	6TM-S47	
C57	.0047	400	RCP10M4472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C58	.0047	600	RCP10M4473M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C59	.01	400	RCP10M4103M	P468-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C60	.047	400	RCP10M4473M	P468-047	DF-503	PTE4S47		PT4147	4TM-S47	
C61A	.01									
B	250		†76X5	†PA-115-5	†PC-80		†1404-01		†103C1	
C										
C62	.0047	600	RCP10M6473M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C63	.01	400	RCP10M4103M	P468-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C64	1000		50X1	BPD-001	DD-102	TM5D1	801-001	DC-531	5HK-D1	
C65	.047	400	RCP10M4473M	P468-047	DF-503	PTE4S47		PT4147	4TM-S47	
C65A	.002					PTE6D2		PT622		
B	.005		†76X7	†PA-110	†PC-100	PTE6D5	†1406-01	PT625	†103C1	
C	.005					PTE6D5		PT625		
C67	4700	500	47X543	1464-005		1DR5D5		MCB465	MS-25	
C68	.0047	400	RCP10M4472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C69	.01	400	RCP10M4103M	P468-01	D6-103	PTE4S1	GP1K-101	UC-531	5GA-T1	
C70	.01	600	RCP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C71	.047	600	RCP10M6473M	P688-047	DF-503	PTE6347		PT6147	6TM-S47	
C72	.047	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C73	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C74	1000		50X1	BPD-001	DD-102	TM5D1	801-001	DC-531	5HK-D1	
C75	1000		50X1	BPD-001	DD-102	TM5D1	801-001	DC-531	5HK-D1	
C76	.01	400	RCP10M4103M	P468-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C77	270	500	RCM20A271K							
C78	.0047	400	RCP10M4472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C79	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C80	.047	200	RCP10M2473M	P488-047	DF-503	PTE4S47		PT4147	2TM-S47	
C81	4700	500	KEH42	1464-005		1DR5D5		MCB465	MS-25	
C82	430	500	RCM20B431K							
C83	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C84	330	500	47X570	1469-00035						
C85	200	500	RCM20A201K	1469-0002		5R5T2		MCB237	MS-32	
C86	.047	400	RCP10M4473M	P468-047	DF-503	PTE4S47		PT4147	4TM-S47	
C87	1000		50X1	BPD-001	DD-102	TM5D1	801-001	DC-531	5HK-D1	
C88	.1	400	RCP10M4104M	P488-1		PTE4P1		PT401	4TM-P1	
C89	.047	400	RCP10M4473M	P488-047		PTE4S47		PT4147	4TM-S47	
C90	.15	400	RCP10M4154M	P488-15		PTE4P15		PT4015	4TM-P15	
C91	.1	200	RCP10M4104M	P288-1	DF-104	P2P1		PT401	2TM-P1	
C92	500	30000	47X560	HV20C	TV5-502	MM-C30T5	413-501	HV50035A	2GDK-T5	
C93	56	1500	47X598		D16-560				20GA-Q56	
C94	10000		47X615	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C95	10000		47X615	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	

Note 1. When using Radio Del. Transformer part #9A2295, C54 is 330MMF (part #47X570)
† Items C61A, C61B, C61C, R64A, R64B are combined in one unit.
When replacing items separately C61B and C61C should total 250MMF.
♦ Items C65A, C65B, C65C, R78A, R78B, R78C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω		76X12B	QJ-418*	RTV-405			Contrast - Panel
B	1Meg							Volume & Sw.-tapped ② 250KΩ trans
R2A	50KΩ		40X361-C	QJ-123	AG-44-B	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	NQ	RB-3/8	AK-4	D6-37	Attach to R2A
R3A	1Meg		40X334-E	QJ-137	AG-51-B	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KB8-1	AK-4	Not Req.	Attach to R3A
R4A	500KΩ		40X333-A	QJ-133	AG-58-B	AB-59	U-50	Brightness
B	Shaft		Not Req.	Not Req.	KB8-3	AK-4	Not Req.	Attach to R4A
R5A	1Meg		40X334-E	QJ-137	AG-51-B	AB-69	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KB8-3	AK-4	Not Req.	Attach to R5A
R6A	150KΩ		40X331-A	QJ-129	AG-52-B	AB-46	U-43	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R6A
R7	7.5Meg		40X363-B					Sync Stability
R8A	4000Ω		40X368-B	QJ-116	AG-80-B	AB-9	SU-16	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R8A
R9A	2.5Meg		40X364	QJ-239	AG-84-B	AB-48	SU-565	Height
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R9A
R10A	2.5Meg		40X364	QJ-239	AG-84-B	AB-83	SU-565	AGC
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R10A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B1T-109 & P1-310 (Panel)
B1S-137X & R2-322 (Rear) & SWITCH 76-2.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R1	15KΩ		12A-004		
R2	470Ω		12A-039		
R3	100KΩ		12A-094	BTS-100K	
R4	100KΩ		12A-166	BTS-100K	
R5	180KΩ		12A-187		
R6	1500Ω		12A-183	BTS-1500Ω	
R7	10KΩ		12A-040		
R8	220KΩ		12A-041		
R9	10KΩ		12A-040	BTS-10 KΩ	
R20	15KΩ		12A-040		
R21	8000Ω	5	43X279	1 3/4A-8000	
R22	12KΩ	2	D84123	BTS-12K	
R23	82000 5%		B83822		
R24	47Ω		B83470	BTS-47	
R25	1000Ω		B85102	BTS-1000	
R26	100KΩ		B85102	BTS-1000	
R27	150Ω		B85151	BTS-150	
R28	22KΩ 5%		B83223		
R29	47Ω		B83470	BTS-47	
R30	1000Ω		B85102	BTS-1000	
R31	150Ω		B85151	BTS-150	
R32	2.7Meg		B84275	BTS-2.7Meg	
R33	470KΩ		B84474	BTS-470K	
R34	47KΩ		B84473	BTS-47K	
R35	330KΩ 5%		B83334	BTS-330K 5%	
R36	100KΩ		B84104	BTS-100K	
R37	22KΩ 5%		B83223		
R38	180Ω		B84181	BTS-180	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R39	1500Ω		B84182	BTS-1500	
R40	47000Ω 5%		B83472	BTS-4700 5%	
R41	5600Ω		C84562	BTA-5600	
R42	1500Ω		B84152	BTS-1500	
R43	33KΩ		B84333	BTS-33K	
R44	1Meg		B84105	BTS-1Meg	
R45	100Ω		B8410	BTS-100	
R46	4700Ω 5%		C83472	BTA-4700 5%	
R47	100KΩ		B85104	BTS-100K	
R48	1Meg		B84105	BTS-1Meg	
R49	22KΩ		B84223	BTS-22K	
R50	100KΩ		B85104	BTS-100K	
R51	47KΩ		B85473	BTS-47K	
R52	100Ω		B84101	BTS-100	
R53	1000Ω		B85102	BTS-1000	
R54	56KΩ		B84563		
R55	100KΩ		B84104		
R56	1000Ω		B85102	BTS-1000	
R57	33KΩ		B84333	BTS-33K	
R58	270Ω		B84271	BTS-270	
R59	68KΩ		B84683	BTS-68K	
R60	22KΩ		B84223	BTS-22K	
R61	22KΩ		B84223	BTS-22K	
R62	68KΩ		B84683	BTS-68K	
R63	10Meg		B85106	BTS-10Meg	
R64A	470KΩ		†76X5	BTS-470K	
B	470KΩ			BTS-470K	
R65	47KΩ	1	B85473	BTS-47K	
R66	330Ω	1	C84331	BTA-330	
R67	1000Ω	2	D84102	BTS-1000	
R68	47KΩ	1	B84473	BTS-47K	
R69	10KΩ		B84103	BTS-10K	
R70	270KΩ		B84274	BTS-270K	
R71	1.5Meg		B84155	BTS-1.5Meg	
R72	68KΩ		B84683	BTS-68K	
R73	820KΩ		B84824	BTS-820K	
R74	2200Ω 5%		B83222	BTS-2200 5%	
R75	3300Ω		B84332	BTS-3300	
R76	22000Ω 5%		B83223	BTS-2200 5%	
R77	1000Ω	1	C84102	BTA-1000	
R78A	32KΩ			BTS-32K	
B	8200Ω		†76X7	BTS-8200	
C	8200Ω			BTS-8200	
R79	1.5Meg		B84155	BTS-1.5Meg	
R80	470KΩ		B85474	BTS-470K	
R81	1.5Meg		B84155	BTS-1.5Meg	
R82	2.2Meg		B84225	BTS-2.2Meg	
R83	180KΩ		B84184	BTS-180K	
R84	10KΩ		B84103	BTS-10K	
R85	2.2Meg		B84225	BTS-2.2Meg	
R86	820Ω		B84821	BTS-820	
R87	2200Ω		B84222	BTS-2200	
R88	6800Ω		B84682	BTS-6800	
R89	560Ω		B84561	BTS-560	
R90	560Ω		B84561	BTS-560	
R91	1000Ω		B85102	BTS-1000	
R92	100KΩ		B84104	BTS-100K	
R93	100KΩ		B84104	BTS-100K	
R94	4.7Meg		B85475	BTS-4.7Meg	
R95	470KΩ		B85474	BTS-470K	
R96	27KΩ		B84273	BTS-2700	
R97	68000Ω	1	C84683	BTA-6800	
R98	6800Ω	1	C84682	BTA-6800	
R99	33KΩ		B84333	BTS-33K	
R100	22000 5%		B83222	BTS-2200 5%	
R101	56000 5%	1	C83562	BTA-5600 5%	
R102	150KΩ 1%		B83154	BTS-510K 5%	
R103	220KΩ 5%		B83234	BTS-220K 5%	
R104	47KΩ		B84473	BTS-47K	
R105	5600Ω		B84562	BTS-5600	
R106	470KΩ		B84473	BTS-470K	
R107	100Ω	2	D84101	BW-2 µ00	
R108	1EKΩ	5	43X376	1 3/4A-1EK	
R109	5.1Ω	3	47X239		
R110	1Meg	1	C85105		
R111	100KΩ	2	D85104	BTB-100K	
R112	10KΩ	5	43X273	1 3/4A-10K	
R113	1500Ω	15	43X375	2D-1500	
R114	330Ω	10	43X373	1 3/4A-350	
R115	270KΩ	3	B85274	BTS-270K	

† Items R64A, R64B, C61A, C61B, C61C are combined in one unit.
♦ Items R78A, R78B, R78C, C66A, C66B, C66C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	Hallidorson PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ② 2A	582VCT .270ADC	5VAC ② 6A	6.3VAC ③1.2A SEC. 4 6.3VAC ③8.5A	53X333					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	Hallidorson PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	190Ω	1100Ω	54X8	A-8135	A-3003	B6702	A-97X	209Y1 ①	Vert.Osc.Trans.
T3	469Ω tap ④-5Ω,	3.5Ω SEC. 2	53X330		HVO-8① ④ & MWC-1		D-22Q ④ & WC-1	222T1 ⑤ & 212R1	Horiz.Output Trans.
	TO,14Ω,	0Ω							
	23Ω,39Ω								
T4	1500Ω tap ④-4.4Ω		51X156	A-8141	A-3039	Z1896 ⑤	A-104X	226T1	Vert.Output Trans.
T5A	23Ω		9A2274	DY-9A	MDF-72	DF802	Y-17	211D2	Horiz.Deflection Coils
B	47Ω								Vert. Deflection Coils
T6	15Ω		9A2262		MWC-5	TW-7	WC-12 ⑥	213R1	Horiz.Linearity Coil
T7	.8Ω		9A2183	WC-4 ⑦	MWC-2⑦ & TW-2 ⑦	TW-2		201R4 ⑦	Width Coil

① Drill new mounting holes.
② Connect original terminal #6 to new terminal #9, original #5 to new #7, original #4 to new #5, original #1 to new #1. Connect primary of MWC-1 across terminals 3 and 1 and secondary to AFC (if picture is out of phase, reverse secondary).
③ Connect terminal #8 to terminal #7, then connect original #6 to new #9, original #5 to new #7 and 8, original #4 to new #5, original #1 to new #1. Connect primary of TW-6 across terminal 3 and 1 and secondary to AFC (if picture is out of phase, reverse secondary).
④ Connect terminal #8 to terminal #7, then connect original #6 to new #9, original #5 to new terminal 7 and 8, original #4 to new #5, original #1 to new #3. Connect primary of WC-11 across terminals 3 and 1 and secondary to AFC (if picture is out of phase, reverse secondary)
⑤ Drill one new mounting hole.
⑥ Connect to coded blue and green terminals.
⑦ Bend clip or use original slider and core.
⑧ Enlarge mounting hole.
⑨ Use Fig. 4 of instruction booklet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T8	5.8KΩ	3.6Ω	450Ω	.85Ω	51X150H	A-3877	A-2930	RO-9 ①	S-3X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP.	REPLACEMENT DATA TRUETONE PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.6Ω	12A480 ① 12A504 ① 12A502 ②	107U	10A31	① 6" PM speaker, not used in all Models. ② 12" PM speaker used in console Models.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0Ω CT	0Ω	A9A2297-2				Channel 2
B	Ant. Coil	0Ω CT	0Ω	A9A2297-3				Channel 3
C	Ant. Coil	0Ω CT	0Ω	A9A2297-4				Channel 4
D	Ant. Coil	0Ω CT	0Ω	A9A2297-5				Channel 5
E	Ant. Coil	0Ω CT	0Ω	A9A2297-6				Channel 6
F	Ant. Coil	0Ω CT	0Ω	A9A2297-7				Channel 7
G	Ant. Coil	0Ω CT	0Ω	A9A2297-8				Channel 8
H	Ant. Coil	0Ω CT	0Ω	A9A2297-9				Channel 9
I	Ant. Coil	0Ω CT	0Ω	A9A2297-10				Channel 10
J	Ant. Coil	0Ω CT	0Ω	A9A2297-11				Channel 11
K	Ant. Coil	0Ω CT	0Ω	A9A2297-12				Channel 12
L	Ant. Coil	0Ω CT	0Ω	A9A2297-13				Channel 13
L2	1st.Choke	0Ω		34A-546				
L3	Neutr.Coil	0Ω		31B-296				
L4A	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-2				Channel 2
B	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-3				Channel 3
C	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-4				Channel 4
D	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-5				Channel 5
E	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-6				Channel 6
F	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-7				Channel 7
G	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-8				Channel 8
H	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-9				Channel 9
I	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-10				Channel 10
J	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-11				Channel 11
K	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-12				Channel 12
L	RF. Mixer Grid & Osc. Coil	0Ω		A9A2296-13				Channel 13
L5	Fil. Choke	0Ω		34A-575				
L6	RF Choke	0Ω		31B-295				
L7	1st. Video IF	1Ω		31A-078				
L8	RF Choke	1.2Ω		31B-230				
L9	Fil. Choke	0Ω		9A2023		19-3001	TV-189	4602	1 Microhenry
L10	2nd.Video IF	.3Ω	.3Ω	9A2320		17-1063		5249	
L11	Fil. Choke	0Ω		9A2023		19-3001	TV-189	4602	1 Microhenry
L12	3rd.Video IF	.3Ω	.3Ω	9A2320		17-1064		5250	
L13	Fil. Choke	0Ω		9A2023		19-3001	TV-189	4602	1 microhenry
L14	RF Choke	2.5Ω		9A1979		19-3036	TV-180	4638	36 Microhenries
L15	4th.Video IF	.3Ω		9A2326			TV-101	6187	Includes trap
L16	Series Peaking Coil	7Ω		36A10		19-4080	TV-180 †	6172 †	60 Microhenries, wound on 22KΩ resistor
L17	Shunt Peaking Coil	25Ω		36A11		19-3500	TV-188	6174	600 Microhenries
L18	4.5MC Trap	.3Ω		9A2074		20-1004	TV-151	1470	
L19	Series Peaking Coil	2.5Ω		9A1979		19-3036	TV-180	6178	36 Microhenries
L20	Shunt Peaking Coil	9Ω		36A16		19-3075 ▲	TV-181▲	6173 ▲	90 Microhenries, wound on 1.5KΩ resistor
L21	Series Peaking Coil	13Ω		36A13		19-4160	TV-184 †	6644 †	150 Microhenries, wound on 82KΩ resistor
L22	Shunt Peaking Coil	14Ω		36A2		19-3180	TV-184	6180	190 Microhenries
L23	1st.Sound IF	2.5Ω		9A2168		17-1031 ▲	TV-113 ♦	1470A ■	
L24	2nd.Sound IF	1.5Ω	1.5Ω	9A2170			TV-113	6203	
L25	Ratio Det.	2.5Ω	.63CT	9A2369 *		17-1035	TV-110	1468	Tertiary winding-.2Ω
L26	Horiz.Osc.	70Ω		9A3096		19-1576	TV-163	6210	

* Some Models use Ratio Det. part #9A2295 (has numerical terminal identification)
Ratio Det. (part #9A2269) has alphabetical terminal identification)
† Parallel with 22KΩ resistor
▲ Parallel with 1.5KΩ resistor
■ Drill mounting holes
♦ Detune unused winding
■ Add 47MMF Cap externally

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L27	.270ADC	42Ω	1.68 Hy.	52X91	C-2326 ①	C-2996 ①	TR-1733 ①	C-17X ①

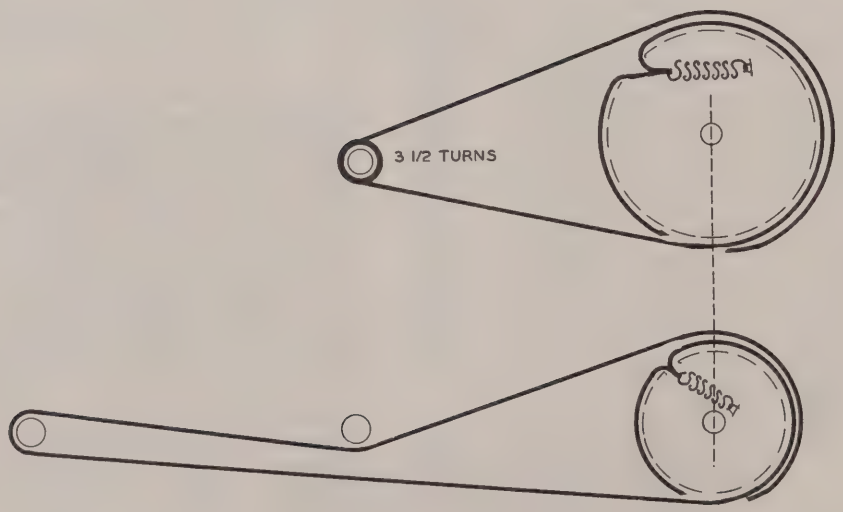
① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRUETONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	4/10A 125V	16X147-3	16X146	313.400 (4/10A-125V)	357001	MDL4/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M2	Dial Light	7A32	Type #51 - Channel Indicator
M3	Dial Light	7A32	Type #51 - UHF Dial
M4	VHF Tuner	25A-1104	
M5	UHF Tuner	25A-1105	
M6	Trap, UHF Filter		
M7	Crystal		1N72 (1N82 may be used) UHF tuner
M8	Magnet	2A426	Focus and centering
M9	Magnet	2A407	Ion Trap
	Back Cover	S-14X69	
	Dial Glass	58X768	UHF
	Knob	10A820-1	Fine tuning (Maroon)
	Knob	10A821-1	Contrast (Maroon)
	Knob	10A822-1	Channel Selector (Maroon)
	Knob	10A779	Volume (Maroon)
	Knob	10A820-2	Fine tuning (Beige)
	Knob	10A821-3	Contrast (Beige)
	Knob	10A822-3	Channel Selector (Beige)
	Knob	10A812-4	Volume (Beige)



UHF DIAL CORD STRINGING

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3871 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light check AC interlock assembly, switch on volume control and T1. If filaments light check M1, V23, V24 and B+ filter and decoupling network components.

SMALL PIX AND / OR DIM RASTER

Substitute V23 and V24. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R109, R110, C92, T3, T5A and other associated components.	Check C82, C84, C85, R103, R104, R106 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22, V23 and V24. Check picture tube and associated components.

BLOOMING

Check by substitution V19, V20, V21, V22, V23 and V24. Check R109, R110, C92, T3, T5A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX (VHF)

Substitute V1, V2, V4, V5, V6 and V7. Check associated components.

RASTER NO SOUND NO PIX (UHF)

Substitute V1, V2, V3, V4, V5, V6 and V7. Check associated components. NOTE! It may be necessary to try several tubes in the UHF tuner to find one that will operate satisfactory.

NO RASTER NO SOUND

See "Dead Set".

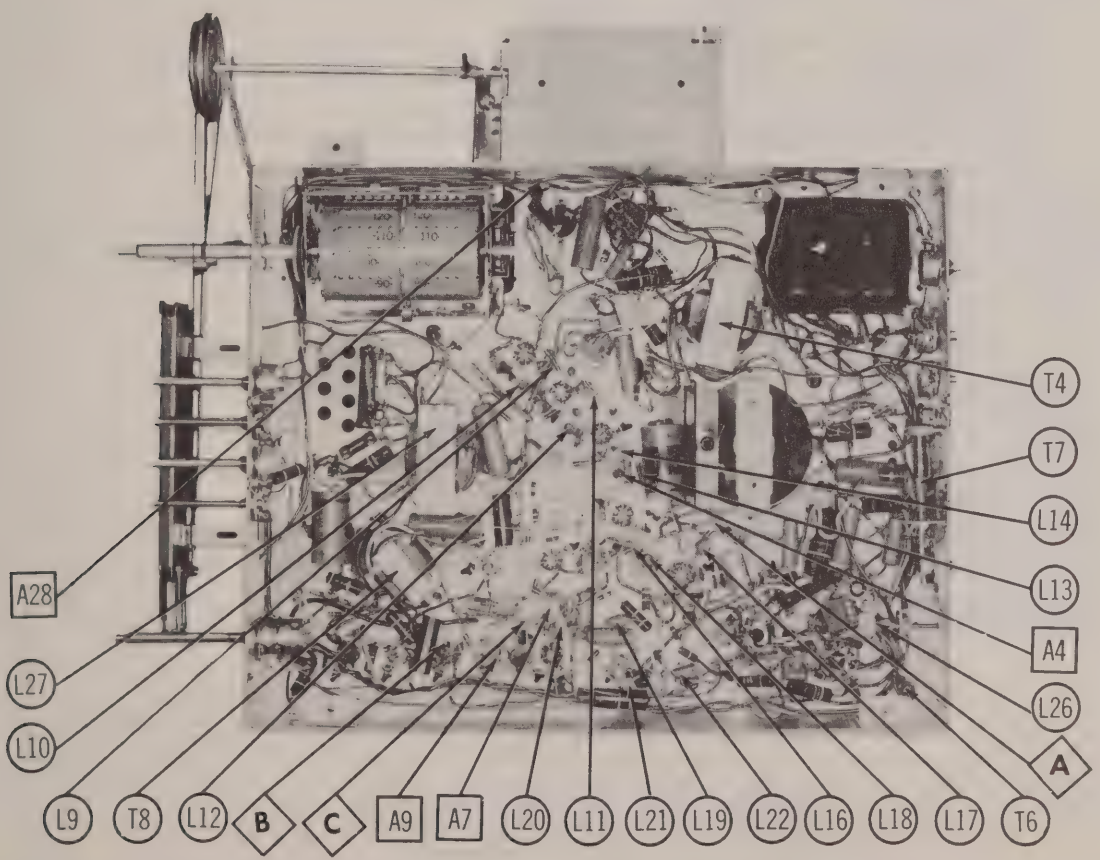
TOTAL LOSS OF SYNC

Check by substitution V16 and V8. Check associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

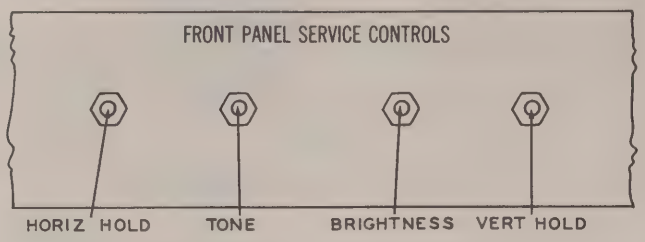
Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

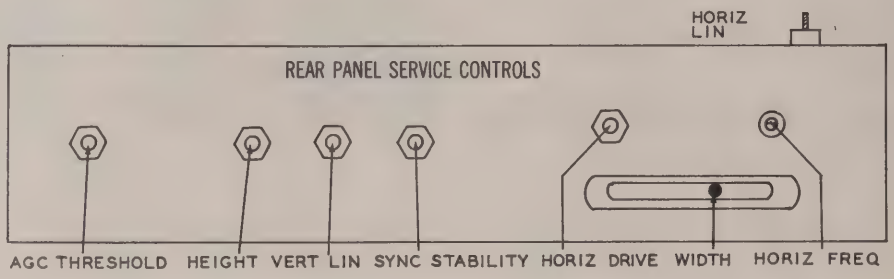
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 wood screws holding wood strip at bottom of safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).





SPECIAL ADJUSTMENTS - SYNC STABILITY CONTROL

Tune set to strongest TV signal available turn the sync stability control clockwise until bending of the picture occurs at the top, then turn counter clockwise until the bending just disappears.

AGC THRESHOLD CONTROL - Tune in strongest TV signal . Turn the control clockwise until overloading appears. turn control counter clockwise until overloading disappears.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (L26) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF detector buzz, adjust the ratio detector secondary (L25) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Turn the disk-like knob and at the same time rotate the ring around the tube until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 2 wood and 2 metal screws. Remove rear cover.
3. Disconnect VHF built-in antenna. Loosen 4 wood screw. Remove VHF and UHF antenna bracket.
4. Disconnect speaker. Remove 4 speaker nuts. Remove speaker.
5. Remove 5 chassis bolts. Remove chassis.

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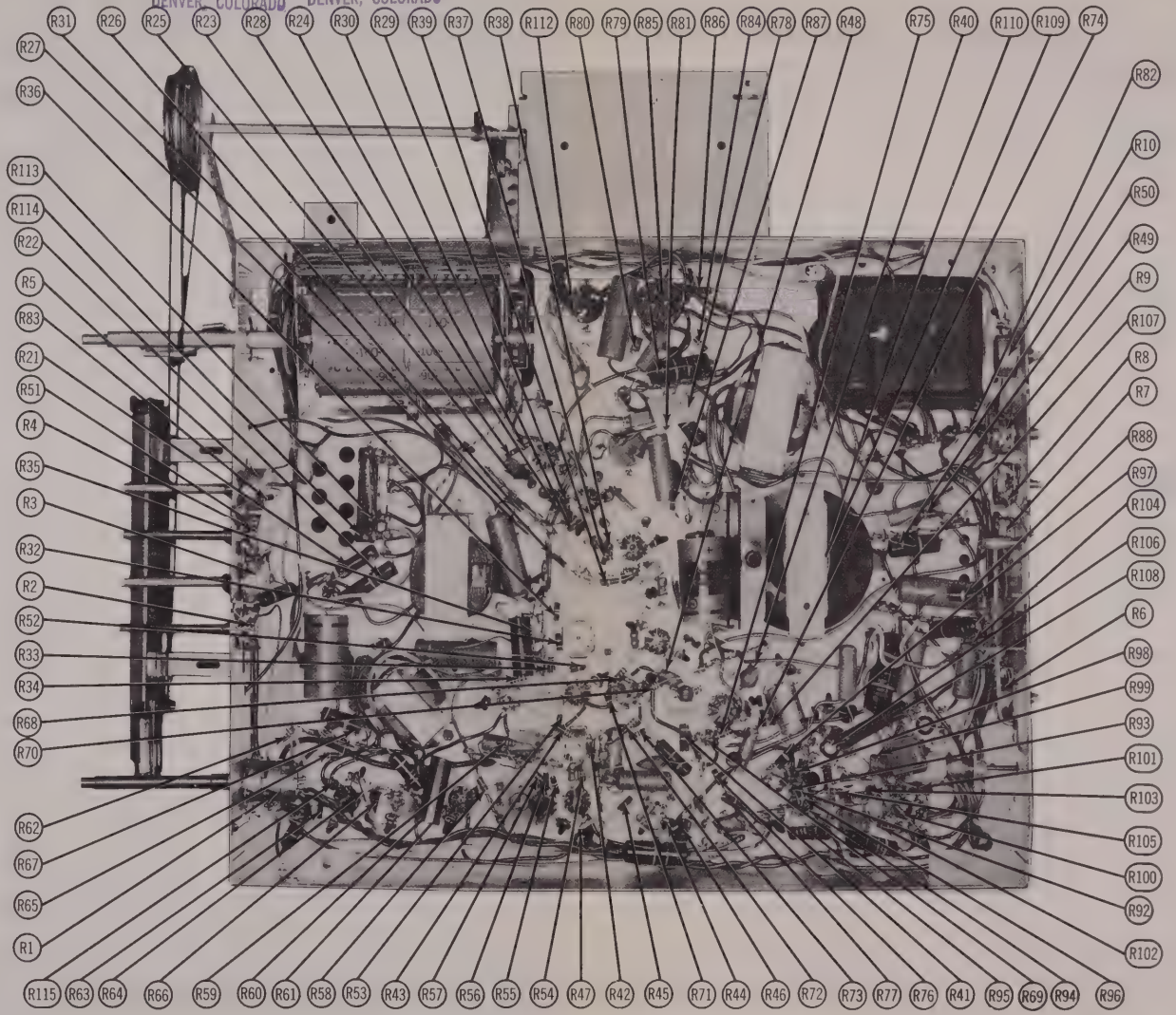

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

WESTINGHOUSE MODELS H-409P4, H-410P4, H-411P4 (Ch. V-2185-1) & Optional Power Supply H-377

WESTINGHOUSE MODELS H-409P4, H-410P4, H-411P4 (Ch. V-2185-1) & Optional Power Supply H-377

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DENVER, COLORADO

WESTINGHOUSE MODELS H-409P4, H-410P4, H-411P4 (Ch. V-2185-1) & Optional Power Supply H-377

TRADE NAME	Westinghouse Models H-409P4 , H-410P4, H-411P4 & Optional Power Supply Model H-377
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Sunbury, Pa.
TYPE SET	Battery Operated Portable Superheterodyne Receiver with Optional Power Supply Unit
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY RATING	1.5 Volts "A" Supply & 67.5 Volts "B" Supply (or) 110-120 Volts AC (Optional Power Supply) 225MA @ 1½ Volts DC & 8MA @ 67½ Volts DC (or) 40MA @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to stator of RF section of tuning gang. Low side to chassis.	455KC (400%Mod)	Tuning gang fully open	Across voice Coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.		Loop	1625KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Adjust for maximum deflection while rocking tuning gang thru 1625KC signal.
3.		"	1400KC	Tune to 1400KC signal	"	A6	Adjust for maximum deflection. Repeat steps 2 and 3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: WESTINGHOUSE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	10	90	V-6321-4	PRS150/12		BBR10-90T		TC42	TVA-1406	
C2	10000		R2CC63Z5Z103P	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C3	4		R1CC61S2L409F							
C4	1500		R2CC61Z5Z152P	BPD-0015	DD-152	TM5D15	812-0015	DC-5215	5HK-D15	
C5	100		R1CC61S3N101M	BPD-0001	DD-101	TM5T1	GP2K-101	UC-531	5GA-T1	
C6	100		R1CC61S3N101M	BPD-0001	DD-101	TM5T1	GP2K-101	UC-531	5GA-T1	
C7	2000		R2CC61Z5Z202P	BPD-002	DD-102	TM5D2	812-002	DC-522	5GA-D2	
C8	5000		R2CC62Z5Z502P	BPD-005	DD-502	TM5D5	812-005	DC-525	5GA-D5	
C9	100		R1CC61S3N101M	BPD-0001	DD-101	TM5T1	GP2K-101	UC-531	5GA-T1	
C10	2000		R2CC61Z5Z202P	BPD-002	DD-102	TM5D2	812-002	DC-522	5GA-D2	
C11	2000		R2CC61Z5Z202P	BPD-002	DD-102	TM5D2	812-002	DC-522	5GA-D2	
C12	5000		R2CC62Z5Z502P	BPD-005	DD-502	TM5D5	812-005	DC-525	5GA-D 5	
C13A	5000	}	V-9044-1	BPD-2X005	DD2-502	TM5DD25	812-005	DC-525	5HK-2D5	
B	5000	}					812-005	DC-525		

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	2 Meg	½	V-11129-1					Volume and switch

RESISTORS

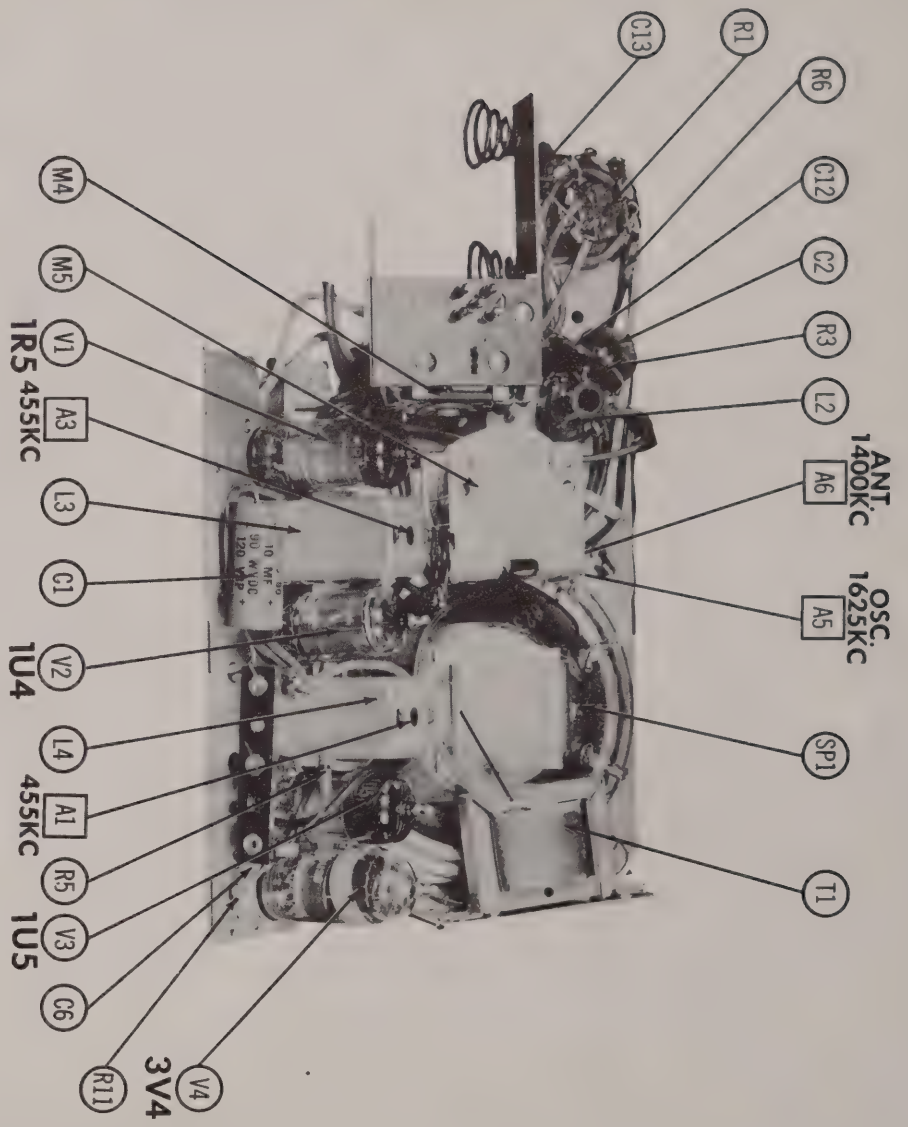
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	100KΩ	½	RC20AE104M	BTS-100K	
R3	15KΩ	½	RC20AE153K	BTS-15K	
R4	4. 7Meg	½	RC20AE475M	BTS-4. 7Meg	
R5	100Meg	½	RC20AE107M		
R6	3. 3Meg	½	RC20AE335M	BTS-3. 3Meg	
R7	47KΩ	½	RC20AE473M	BTS-47K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R8	10Meg	½	RC20AE106M	BTS-10Meg	
R9	4. 7Meg	½	RC20AE475M	BTS-4. 7Meg	
R10	1Meg	½	RC20AE105M	BTS-1Meg	
R11	4. 7Meg	½	RC20AE475M	BTS-4. 7Meg	
R12	3. 3Meg	½	RC20AE335M	BTS-3. 3Meg	
R13	560Ω	½	RC20AE561K	BTS-560	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	NOTES
T1	9.8KΩ	3.6Ω	384Ω	.55Ω	V-11926-1	A-3329	A-2927	Z1110	S-11X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.6Ω	V-11924-1	3A07	35J4	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.7Ω		V-11921-1				
L2	Osc. Coil	1.1Ω	8.5Ω	V-11128-2	14-1073		69-Osc.†	
L3	Input IF	23Ω	23Ω	V-11925-1	16-6758	BC-352	12-C1	
L4	Output IF	23Ω	23Ω	V-11925-1	16-6758	BC-353	12-C2	

† Drill mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.
L5	.225A	2.7Ω	47 MH	V-11303				

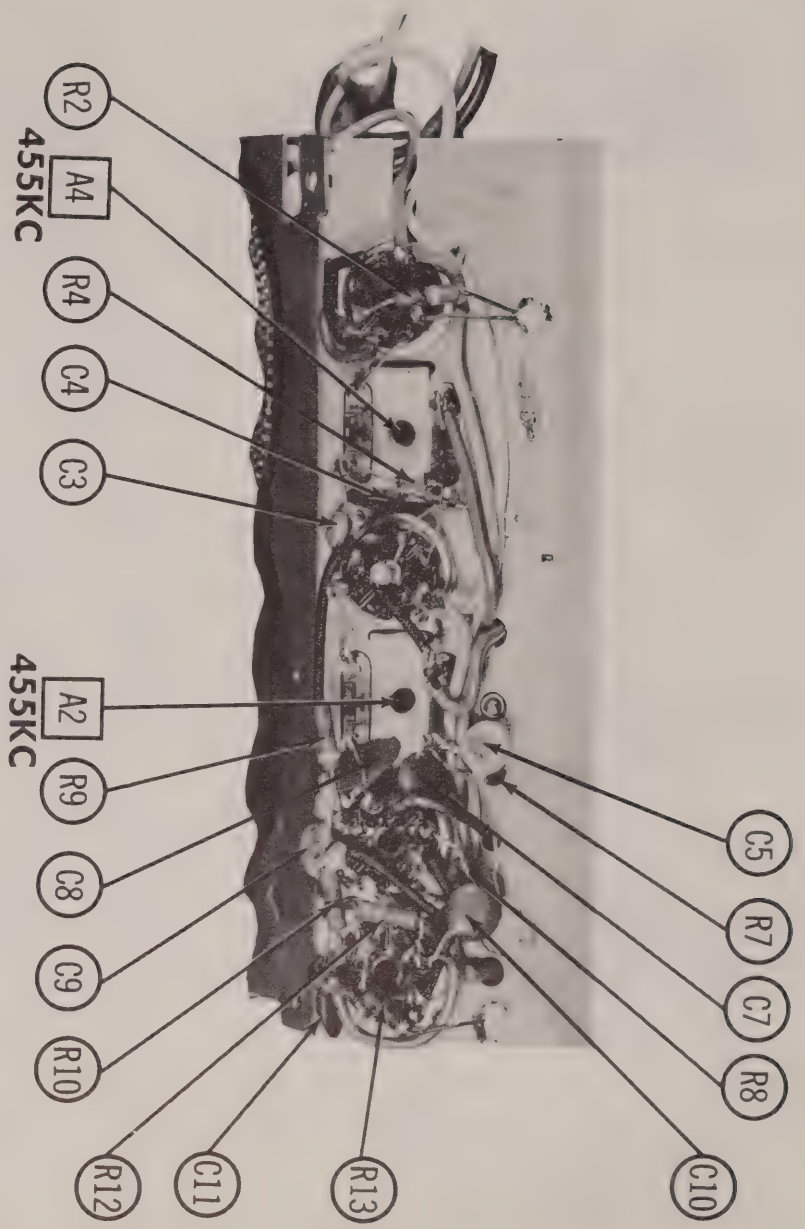
BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V		950 * or 964	477		2R * or 2IR	P45		Two used in parallel * Mounting bracket must be reversed 180 degree when using "D" size "A" batteries.
M2	67.5V								

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M3	Tuning cap	V-11919-1	2 section (23-225MMF, 10-105MMF)
M4	Switch	V-12211-1	Power changeover
	Cabinet	V-11949-1	Assembly (back cover, handle, baffle & grille cloth) H-409P4
	Cabinet	V-11949-2	Assembly (back cover, handle, baffle & grille cloth) H-410P4
	Cabinet	V-11949-3	Assembly (back cover, handle, baffle & grille cloth) H-411P4
	Knob	V-11942-1	Volume H-409P4
	Knob	V-11942-2	Volume H-410P4
	Knob	V-11942-3	Volume H-411P4
	Dial	V-11941-1	Tuning

CHASSIS—BOTTOM VIEW



MODEL H-377 PARTS LIST

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C14	20	150	V-6321-3	PRS150/20		BR2015A		TC45	TVA-1410	
C15A	■1500	3	V-11184-1	E3C429					TVL-3015	
B	▲1500	3								
C	1500	3								

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R14	8Ω	1	V-11345-1					Filament voltage

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Westinghouse PART No.	IRC PART No.	NOTES
R15	4700Ω	1	RC30AE472K	BTA-4700	
R16	3900Ω	1	V-6067-10	BTA-3900	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Westinghouse PART No.	IRC PART No.	NOTES
R17	56Ω	1			Note

Note: Not used in all models.

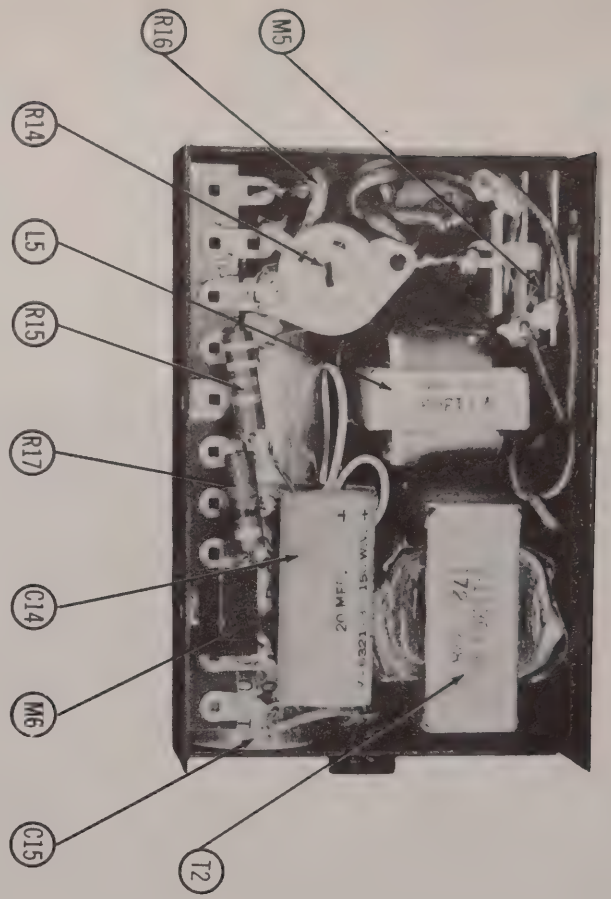
TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.
T2	117VAC ②.04A	10VCT .250ADC	135V .017A		V-11304				

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA Westinghouse PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	NOTES
M5	.250A	V-11302		403C1EX1	8835 ①		① Drill mtg. hole. Run wire to tie points.
M6	.017	V-11189		1159			

MODEL H-377



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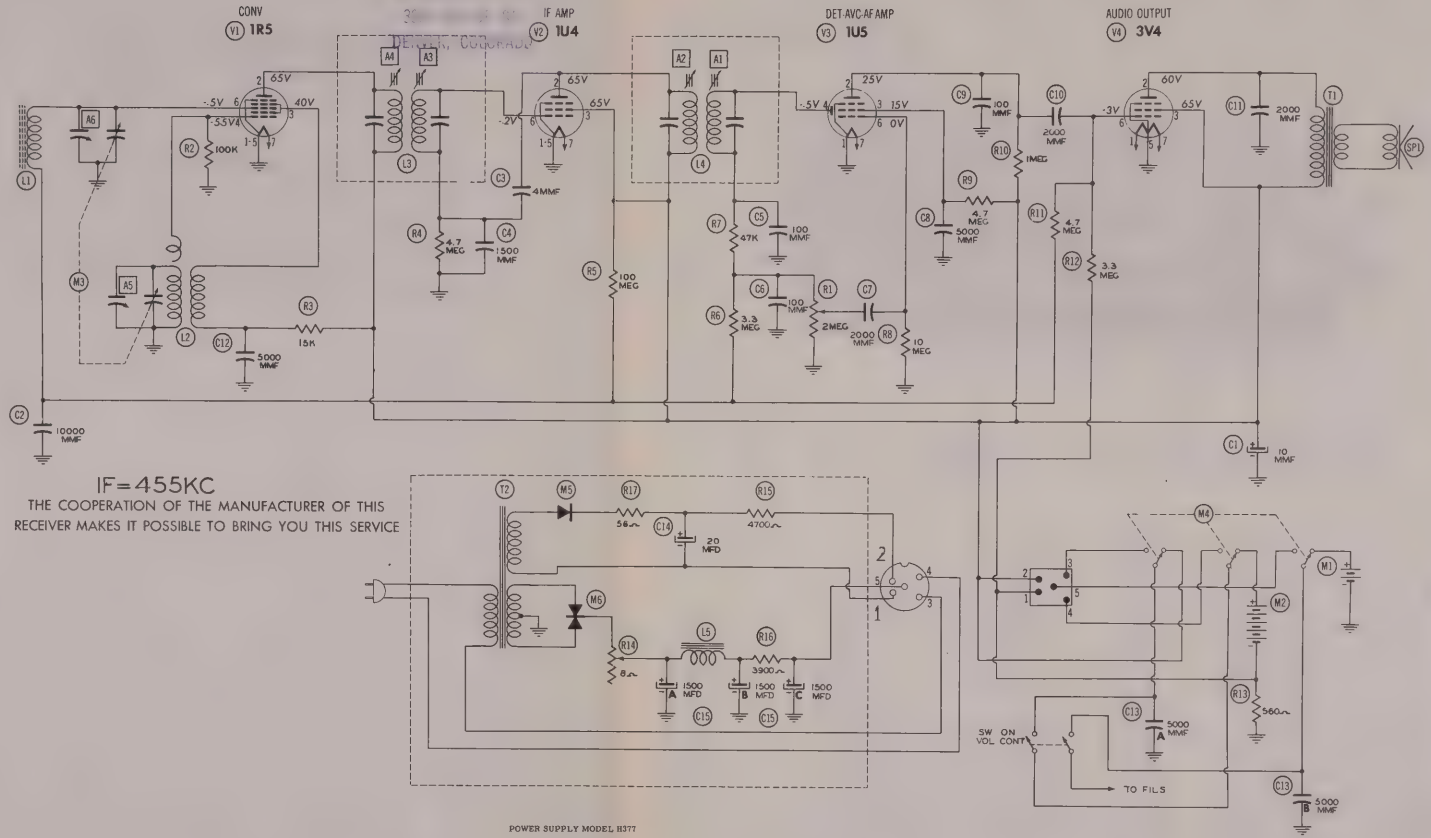

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

POWER SUPPLY MODEL H377

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†23Ω	†15KΩ	100KΩ	0Ω	5.2Meg	*
V 2	1U4	0Ω	†23Ω	†0Ω	INF	0Ω	4.7Meg	*
V 3	1U5	0Ω	†1Meg	†4.7Meg	2Meg	2Meg	10Meg	*
V 4	3V4	*	†385Ω	†0Ω	560Ω	0Ω	3.3Meg	*

ALL VOLTAGES MEASURED USING BATTERY POWER
† MEASURED FROM "B+"
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 17% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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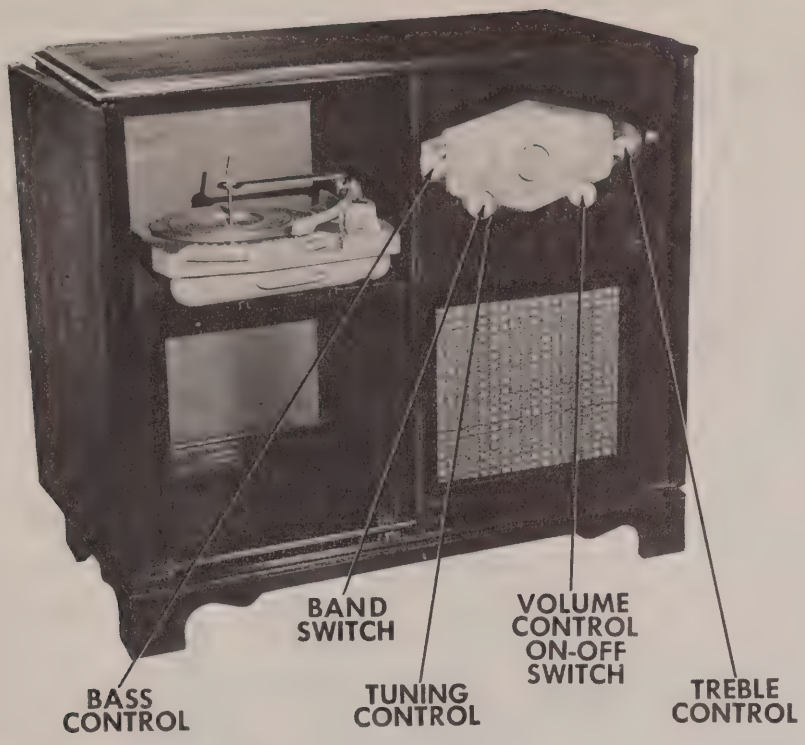
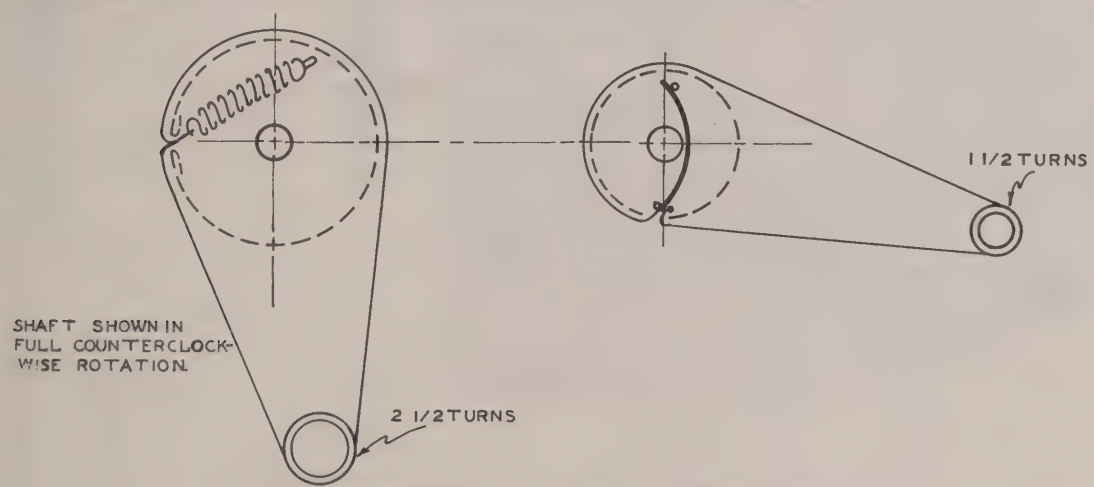
ZENITH
MODELS L1083E, L1086R (Ch. 10L20)



ZENITH
MODELS L1083E, L1086R (Ch. 10L20)

TRADE NAME	Zenith Models L1083E, L1086R (Ch. 10L20)	
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.	
TYPE SET	AC Operated AM-FM-Phono Combination Superheterodyne Receiver	
TUBES (Ten)	Types 6BJ6 RF Amp., 12AT7 Conv., (2) 6BA6 IF Amp., 6AU6 Limiter, 6T8 Disc.-AM Det.-AF Amp., 6C4 Phase Inv., (2) 6V6 Audio Output , 5Y3GT Rectifier	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .89 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	540-1620KC	FREQ.MOD. 88-108MC



DRIVE CORD STRINGING

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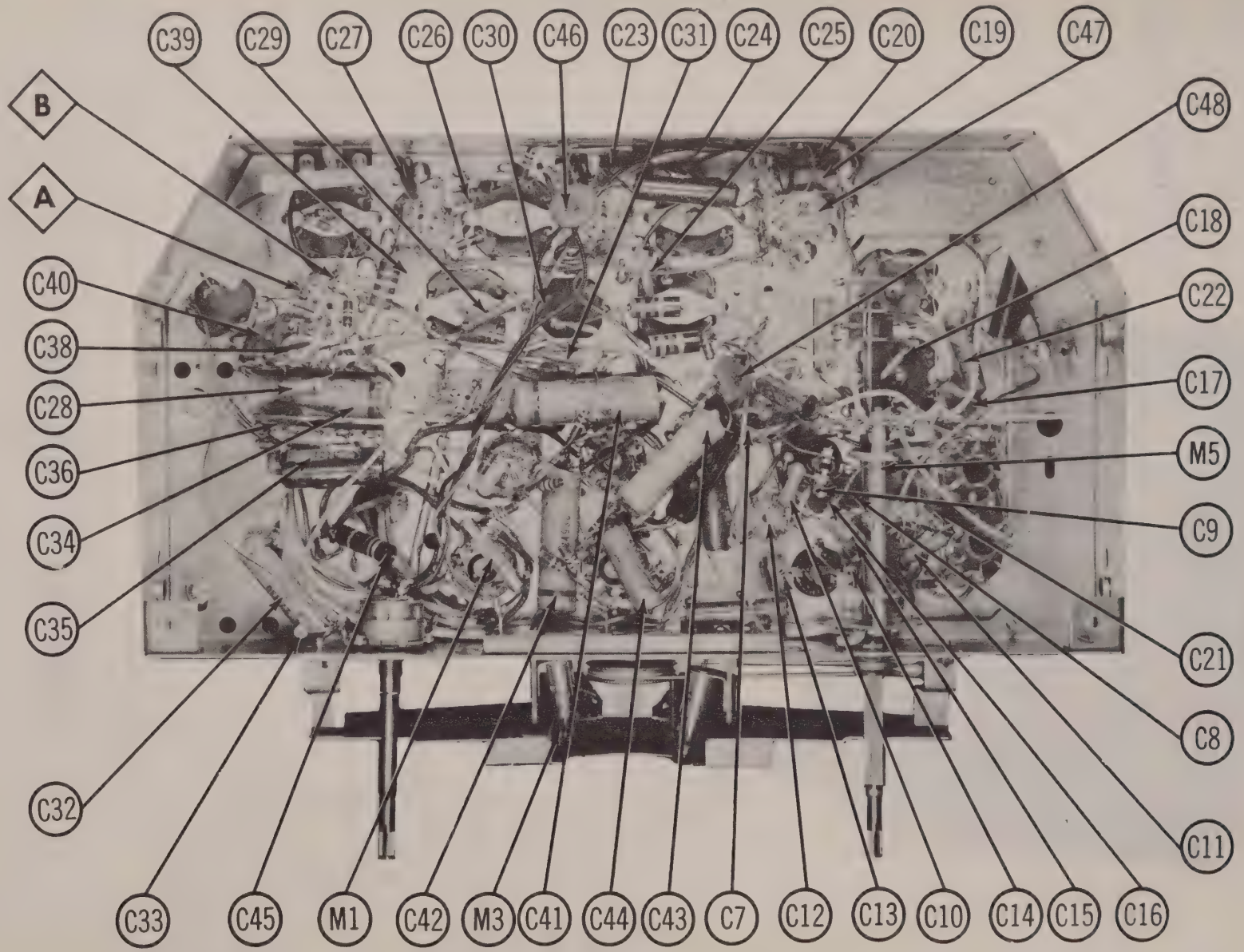
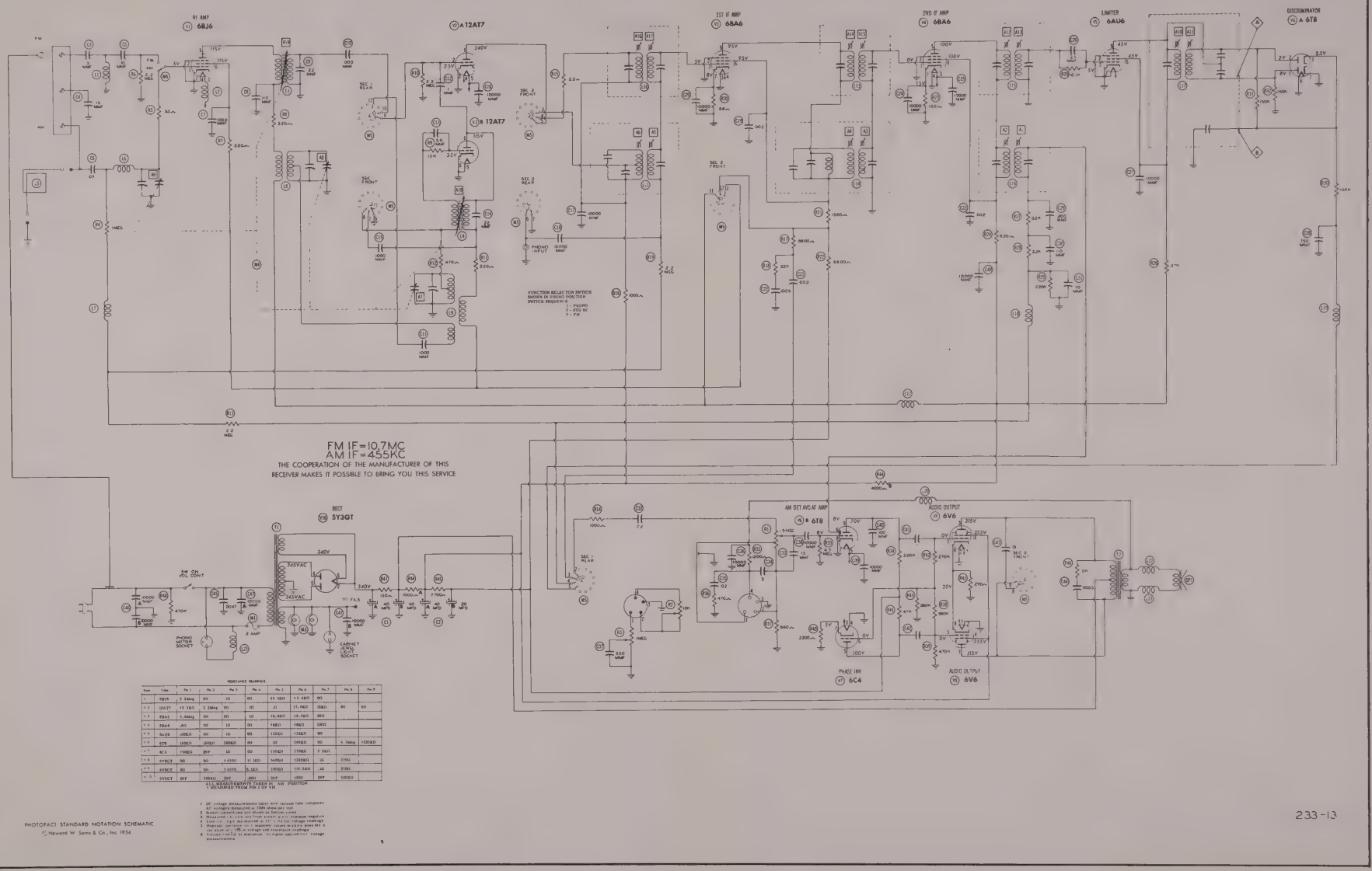


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
1	6BJ6	3.3Meg	0Ω	0Ω	0Ω	11.4kΩ	11.4kΩ	0Ω		
2	12AT7	10.2kΩ	3.3Meg	0Ω	0Ω	.2Ω	15.4kΩ	10kΩ	0Ω	0Ω
3	12AT	4.4Meg	0Ω	0Ω	0Ω	16.8kΩ	16.5kΩ	6kΩ		
4	6BA6	.4Ω	0Ω	0Ω	0Ω	160Ω	180Ω	100Ω		
5	6AU6	.008Ω	0Ω	0Ω	0Ω	1232Ω	1232Ω	0Ω		
6	6T8	100kΩ	.05Ω	300kΩ	0Ω	0Ω	300kΩ	0Ω	6.1Meg	1231kΩ
7	6C4	100kΩ	OFF	Ω	0Ω	150kΩ	270kΩ	2.2kΩ		
8	6V6GT	0Ω	0Ω	1100Ω	31.1kΩ	340kΩ	1225kΩ	0Ω	270Ω	
9	6V6GT	0Ω	0Ω	1100Ω	5.1kΩ	190kΩ	10.5kΩ	.4Ω	270Ω	
10	5Y3GT	OFF	300kΩ	OFF	1MΩ	OFF	1MΩ	OFF	300kΩ	

ALL MEASUREMENTS TAKEN IN AM POSITION
* MEASURED FROM PIN 2 OF V10

1 DC voltage measurements taken with vacuum tube voltmeter.
2 AC voltages measured at 1000 ohms per volt.
3 Resistance readings not shown as bottom zeros.
4 Measurements taken and from ground to chassis negative.
5 Line cord type as viewed at 11" - 14" line voltage readings.
6 Maximum variation in equipment causing readings from 90 to 130 volts line voltage and resistance readings.
7 Voltage variation at maximum for signal applied for voltage measurements.

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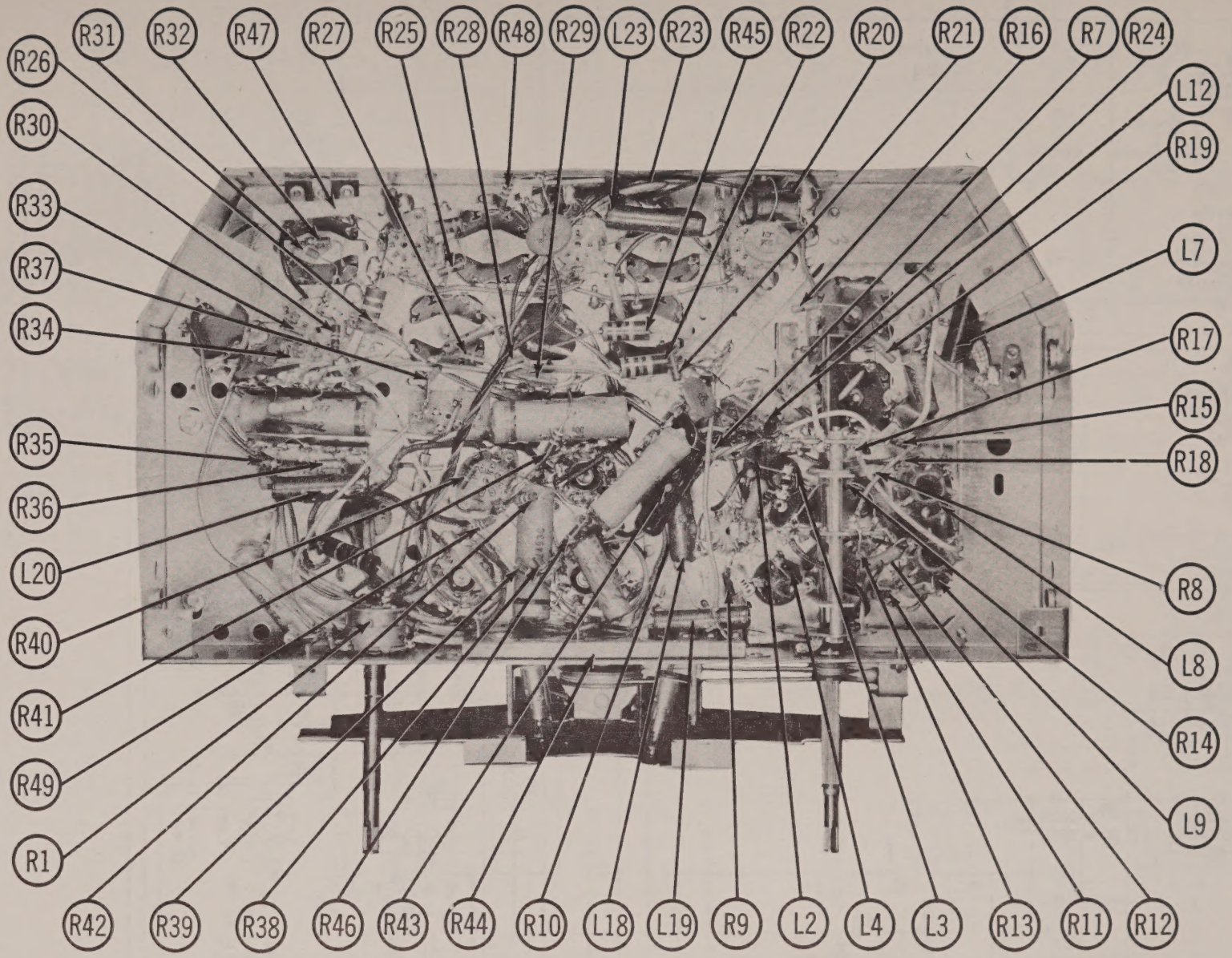


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MODEL L10838, (Ch. 10L20)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output os signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use Zenith alignment wrench 68-19 or equivalent for aligning IF transformers.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	455 KC (400~Mod)	BC	600KC	Across voice coil	A1, A2 A3, A4 A5, A6	Adjust for maximum deflection.
2.		Loop	1600KC	"	1600KC	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	1400KC	"	A8, A9	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use a 2 Meg ohm isolating resistor in series with DC probe of VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.05MFD	High side to pin (grid) of 6AU6 (V5). Low side to chassis.	10.7MC (Unmod)	FM	Point on non-interference	DC probe to point Ⓐ. Common to chassis.	A10	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
6.	"	High side to pin 1 (grid) of 6BA6 (V4). Low side to chassis.	"	"	"	DC probe to pin 1 (grid) of 6AU6 (V5). Common to chassis.	A12 A13	Adjust for maximum deflection.
7.	"	High side to pin (grid) of 6BA6 (V3). Low side to chassis.	"	"	"	"	A14 A15	"
8.	"	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	"	"	"	"	A16 A17	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.05MFD	High side to pin 1 (grid) of 6AU6 (V5). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A10	Adjust for curve of maximum amplitude and symmetry as in Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A11	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.
6.	"	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	"	"	"	Vert. Amp. to pin 1 (grid) of 6AU6 (V5). Low side to chassis.	A12, A13 A14, A15 A16, A17	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. Continue with Step 9.

FM RF AND MIXER ALIGNMENT

Slugs may be loosened by applying hot iron to cement.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	270Ω carbon resistors	High side thru 270Ω to FM antenna terminal. Low side to chassis.	98MC (Unmod)	FM	98MC	DC probe thru 2 MegΩ to pin 1 (grid) of 6AU6 (V5). Common to chassis.	A18	Adjust for maximum deflection.
10.	"	"	"	FM	"	"	A19	"

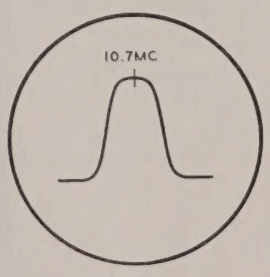


FIG. 1

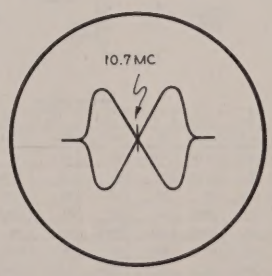


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

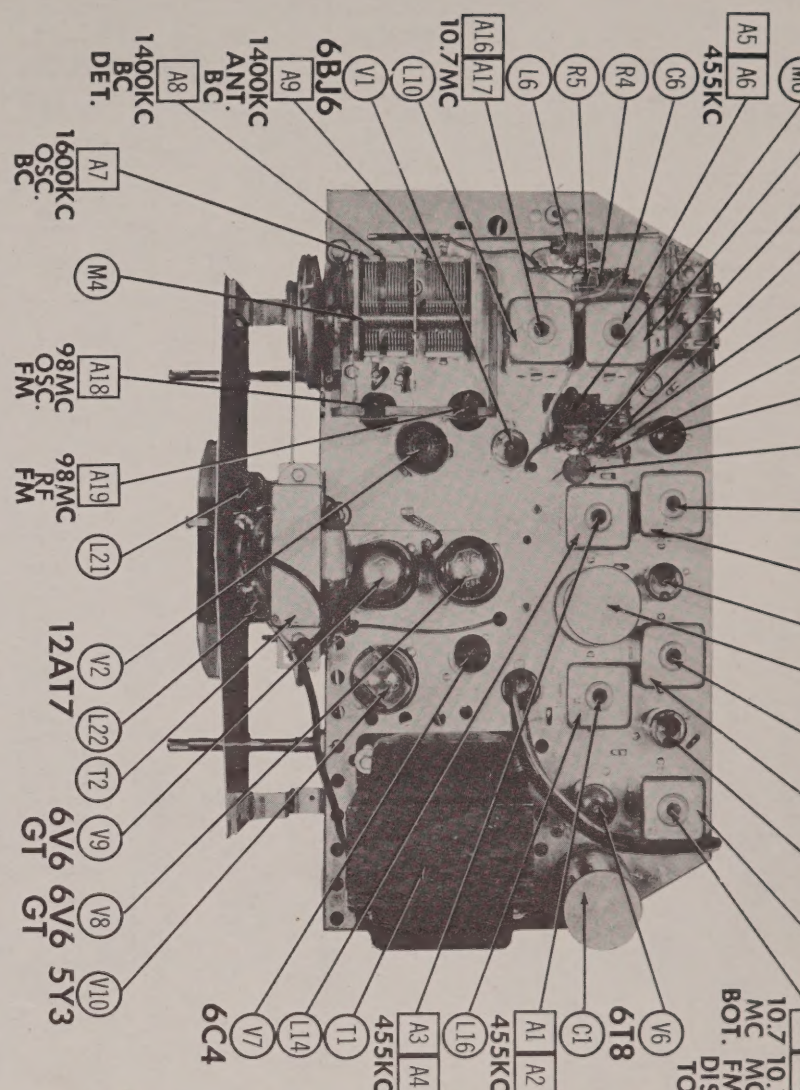
ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BJ6	6BJ6	7CM	
V2	Converter	12AT7	12AT7	9A	
V3	1st IF Amp.	6BA6	6BA6	7BK	
V4	2nd IF Amp.	6BA6	6BA6	7BK	
V5	Limiter	6AU6	6AU6	7BK	
V6	Disc-AM Det-AF Amp.	6T8	6T8	9E	
V7	Phase Inverter	6C4	6C4	6BG	
V8	Audio Output	6V6	6V6	7S	
V9	Audio Output	6V6	6V6	7S	
V10	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	22-1612	AFH2-57		BO45		FP238	TVL-2764	
B	▲40	450								
C2A	▲40	450	22-2243	AFH2-56		BO44		FP376.5	TVL-3780	
B	▲20	350								
C3	15		22-2140	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C4	15		22-2140	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C5	110		22-5	SI110						
C6	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C7	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C8	110		22-5	SI110						
C9	22		22-1506	SI22N080			N080-331-220			
C10	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C11	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C12	1		22-1762	SI1NP0	TCZ-1		NP0K-010		5TCCB-V1	
C13	50		22-1367	SI50NP0	TCZ-50		NP0K-500	ZT-545	5TCC-Q5	
C14	22		22-1506							
C15	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C16	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C17	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C18	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C19	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C20	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C21	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C22	.005	600	22-1135	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C23	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C24	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C25	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C26	25		22-1887	SI25	D6- 250		GP1K-250	UC-5425	5GA-Q25	
C27	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C28	750		22-1962	SI750	D6-751		GP2K-751		5GA-T75	
C29	200		22-1668	SI200	D6-201		GP2K-201	UC-532	5GA-T2	
C30	110		22-5	SI110						
C31	110		22-5	SI110						
C32	.02	600	22-830	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C33	15		22-2140	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C34	.3	200	22-2493					TP-444		
C35	.02	400	22-1127	P488-05	DF-203	PTE4S2		PT412	4TM-S2	
C36	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C37	330		22-2309	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C38	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C39	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C40	100	500	22-365	1468-0001	D6-101	5W5T1	GP1K-101	MC-235	1FM-31	
C41	.1	600	22-417	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C42	.1	600	22-417	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C43	.01	1200	22-455	P1688-01		PTE16S1		PT1611	MB-S1	
C44	.0005	1600	22-2493	2584-0005					MB-T5	
C45	.0047	600	22-1782	P688-0047		PTE6D47		PT6247	6TM-D47	
C46A	10000		22-2276	BPD-2X01	DD3-103	TM5DS1	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C47A	10000		22-2276	BPD-2X01	DD3-103	TM5DS1	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C48	10000		22-3	BPD-01	DD-103	TM5D1	811-01	DC-511	5HK-2S1	

CHASSIS—TOP VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1.5Meg	½	63-2891	Q18-139X		ABT-82		Volume tapped at 800K
B	Shaft		Not Req.	Not Req.		AK-4		Attach to R1A
C	Switch		Not Req.	76-1		KB-1		Attach to R1A
R2A	10KΩ	½	63-2892	Q13-116	AG-63-Z	AB-15	U-18	Bass
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	1Meg	½	63-2893	Q13-137	AG-81-Z	AB-70	U-53	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R4	1Meg	½	63-1912	BTS-1Meg	
R5	33Ω	½	63-1723	BTS-33	
R6	2.2Meg	½	63-1926	BTS-2.2Meg	
R7	220Ω	½	63-1758	BTS-220	
R8	220Ω	½	63-1758	BTS-220	
R9	10KΩ	½	63-1827	BTS-10K	
R10	2.2Meg	½	63-1926	BTS-2.2Meg	
R11	220Ω	½		BTS-220	
R12	470Ω	½	63-1772	BTS-470	
R13	2.2Meg	½		BTS-2.2Meg	
R14	1000Ω	½	63-1786	BTS-1000	
R15	22Ω	½	63-1716	BTS-22	
R16	1000Ω	½	63-1786	BTS-1000	
R17	6800Ω	½	63-1820	BTS-6800	
R18	22KΩ	½	63-1841	BTS-22K	
R19	2.2Meg	½	63-1926	BTS-2.2Meg	
R20	68Ω	½	63-1737	BTS-68	
R21	1500Ω	½	63-1793	BTS-1500	
R22	6800Ω	2		BTB-6800	
R23	100Ω	½	63-1744	BTS-100	
R24	820Ω	½	63-2091		
R25	100KΩ	½	63-1870	BTS-100K	
R26	27KΩ	1	63-1845	BTS-27K	
R27	22KΩ	½	63-1842	BTS-22K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R28	22KΩ	½	63-1842	BTS-22K	
R29	220KΩ	½	63-1884	BTS-220K	
R30	100KΩ	½	63-1869	BTS-100K	
R31	150KΩ	½	63-1876	BTS-150K	
R32	150KΩ*	½	63-1876	BTS-150K	
R33	4.7Meg	½	63-1876	BTS-4.7Meg	
R34	220KΩ	½		BTS-220K	
R35	1200Ω	½	63-1789	BTS-1200	
R36	470Ω	½	63-1771	BTS-470	
R37	680Ω	½	63-1778	BTS-680	
R38	390KΩ	½	63-1894	BTS-390K	
R39	470KΩ	½	63-1898	BTS-470K	
R40	2200Ω	½	63-1799	BTS-2200	
R41	47KΩ	½	63-1856	BTS-47K	
R42	270KΩ	½	63-1887	BTS-220K	
R43	270Ω	2	63-1452		
R44A	1000Ω	10	63-2864		
B	4000Ω	10			
R45	2700Ω	2	63-2297	BTB-2700	
R46	10KΩ	½	63-1827	BTS-10K	
R47	130Ω	5	63-2142		
R48	470KΩ	½	63-1898	BTS-470K	
R49	390KΩ	½	63-1894	BTS-390K	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	ZENITH PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.
T1	117VAC	686VCT @ .89A	5VAC @ 2A	6.3VAC @ 3.4A	95-1253	PC-8410 ①			

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	9.8KΩ CT	3.6Ω	700ΩCT	.5Ω	95-1355	A-3870 ①	A-3020 ①	Z1117 ①	S-15X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	VIKING PART No.	QUAM PART No.	
SP1	12"	PM	3.6Ω	49-739	12J11	12A31	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		S-16408				
L2	Fil. Choke	.7Ω		S-13997			4612	9.5 Microhenries
L3	FM RF Coil	0Ω	0Ω	S-15743				
L4	FM Osc. Coil	0Ω	0Ω	S-15691				
L5	AM Loop Ant.	0Ω		S-17917				
L6	Ant.-Loading Coil	3.4Ω		S-18812	19-3250	TV-185	4646	223 Microhenries
L7	RF Choke	0Ω		20-337			4608	5 Microhenries
L8	AM RF Coil	2.4Ω	11Ω	S-16344				Sec. tapped @ 3.1Ω
L9	AM Osc. Coil	1.1Ω	8.5Ω	S-16345				Sec. tapped @ 3.4Ω, pickup winding - 1.2Ω
L10	1st. FM IF	.4Ω	.4Ω	95-1201	16-6665 *	FM-251	1451	
L11	1st. AM IF	16Ω	16Ω	95-1248				Pri. tapped @ 4.4Ω
L12	RF Choke	0Ω		20-337			4608	5 Microhenries
L13	2nd. FM IF	.4Ω	.4Ω	95-1150	16-3487 †	FM-251 ▲	1451 ▲	
L14	2nd. AM IF	16Ω	16Ω	95-1249				Tertiary winding = .4Ω
L15	3rd. FM IF	.4Ω	.4Ω	95-1150	16-3487 †	FM-251 ▲	1451 ▲	
L16	3rd. AM IF	16Ω	10Ω	95-1254	16-5742 ▲	BC-340 ▲	912-C4 ▲	
L17	FM Discriminator	.4Ω	.4Ω	95-1153	17-3484 ■	FM-250 ▲	1452 ▲	
L18	AM Audio Coupling	0Ω		20-337			4608	5 Microhenries
L19	FM Audio Coupling	0Ω		20-337			4608	5 Microhenries
L20	Audio Choke	0Ω		20-337			4608	5 Microhenries
L21	Audio Choke	0Ω		20-337			4608	5 Microhenries
L22	Audio Choke	0Ω		20-337			4608	5 Microhenries
L23	Line Choke	0Ω		20-337			4608	5 Microhenries

* Drill new mounting holes.
† Remove center spade bolt mounting support and use adaptor plate
▲ Remove center spade bolt mounting support
▲ Add diode filter capacitor externally and remove center spade bolt mounting support
■ Add diode filter capacitor externally, drill new mounting holes, and remove center spade bolt mounting support.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T	2A 250V	36-24		318002. (3AG P/T-2A)		GJV2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	ZENITH PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	142-72							

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Dial light	100-67	(2) # 47 bayonet
M4	Tuning cap	22-2400	3 section (18-370MMF, 11-200MMF, 11-85MMF)
M5	Switch	85-531	Function
M6	Switch	85-505	Antenna (SPDT) functions with band switch
	Cabinet	14-1573E	Model L1083E
	Cabinet	14-1581R	Model L1086R
	Back cover	2-330	Phono section-L1083E
	Back cover	2-332	Phono section-L1086R
	Knob	8-19316	Off-on volume (assembly)
	Knob	46-1041	Tuning
	Knob	46-1043	Function
	Knob	46-1153	(2) tone
	Dial crystal	192-138	